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Flower Garden



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The Winnipeg Horticultural Society
1946*

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Foreword

WHILE I consider it a great privilege to have the opportunity of writing this foreword for the 1946 Year Book, it is with the feeling that the amateur has for the professional, my predecessors having been, for the most part, outstanding in the field of horticulture. It may be wise, occasionally, to have a layman in an executive position so that the problems of the amateur may be brought to the forefront of the Society's activities.

The contents of this book cover a variety of subjects prepared by those well versed in their particular line and possession of the book is well worth the membership fee required to obtain it.

In the past the judging of rock gardens has been in conjunction with the Home Grounds competition, but this is considered much too late. This year, in order that they may be seen at their best, judging of those gardens will be made earlier in the year, possibly the latter part of June. If you have this type of garden, send in your entry and help make the innovation worth while.

Plans are under way for the Annual Flower Show and it is hoped that members will so plan their gardens that they will have blooms worthy of entry. As an additional feature for this year Home Crafts and Weaving will be on display and in competition. Further particulars are contained elsewhere in this book.

In an effort to increase our membership so that the society will be more representative of the city we ask that all present members co-operate with the membership committee by endeavoring to interest others in our work. The larger the membership the greater the opportunity for us to assist garden-minded citizens.

The aftermath of the war is most serious owing to the critical food shortage throughout the world, therefore, it is essential that we do everything in our power to alleviate the resulting suffering. As a means to this end we urge the continuance of Victory gardening.

In conclusion I should like to thank all those whose efforts have made the printing of this book possible, also the directors and members for their confidence and support.

J. C. WILLIAMS,

President

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for 1946

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1938—Dr. W. J. Riley	

*Deceased.

Winnipeg Horticultural Society

STATEMENT OF RECEIPTS AND DISBURSEMENTS FOR YEAR ENDING OCTOBER 31ST, 1945

RECEIPTS:

Balance on hand, Nov. 1st, 1944	\$ 129.41
Membership fees for 1945	432.00
Membership fees paid for 1946	56.00
Government grants	83.40
Donations	345.00
Entry fees at Flower Show	31.30
Advertising space	280.00
Rent of space at Flower Show	65.00
Miscellaneous	75.37
	<hr/> \$1,597.48

DISBURSEMENTS:

Flower Show:	
Prizes	\$480.25
Entry tickets, ribbons, etc.	46.10
Rent of rink	50.00
Help at rink	30.00
Cost of prize list	92.07
Cartage	9.75
Other expenses	13.95
	<hr/> \$ 722.12
Home Ground Competition, prizes	40.00
Year Book	401.16
Printing	112.50
Postage	109.30
Stationery	22.10
Secretary's honorarium	75.00
Secretary's expenses	10.00
Engraving cups	5.00
Refund of donations	11.00
Presentation	20.00
Telegrams	1.94
Bank charges	5.00
Rent of room for meetings	10.00
Radio talks	10.00
Flowers	5.00
	<hr/> 1,560.12
Balance on hand, Nov. 1st, 1945	37.36
	<hr/> \$1,597.48

R. W. BROWN, *Secretary-Treasurer.*

AUDITOR'S REPORT

To the President and Members,
Winnipeg Horticultural Society:

I have compared the above statement with the books and vouchers relating thereto and certify that it is a correct record of the Receipts and Disbursements of the Winnipeg Horticultural Society for the year ending October 31st, 1945.

J. A. MACPHAIL, *Auditor.*

Winnipeg, November, 1945.

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PRESIDENT'S ANNUAL REPORT for 1945

By MR. ERIC SOCHTING

In presenting the report for 1945, I think we all consider this an occasion for thanksgiving, for victory and peace.

For the Society a very successful year has come to an end, success which I hope will continue. Keep the victory spirit up and make the Winnipeg Horticultural Society so strong that it will be held a privilege to be a member.

The public meetings were very well attended and as usual, were held every second Thursday throughout the winter months.

We held two fall meetings which were well attended. They proved how important meetings are at that time of the year.

The Year Book was again published after having been discontinued for two years. The book contained 95 pages of good information as well as 6 full page pictures. It was very well received, in fact, many people bought a copy and thereby became new members of the Society. It is also worth mention that after financing the printing of the book, we had a surplus of \$55.00 from our advertising and donations.

The annual home grounds competition was very good, and many exceptionally fine gardens were exhibited. But, ladies and gentlemen, I think you can improve this competition. I would like to see many more members compete. Come on, be a good sport. This competition was judged by W. R. Leslie, Superintendent of the Dominion Experimental Station, at Morden, who was assisted by Prof. E. T. Andersen and our Secretary, Mr. Brown. Mr. Leslie is a real friend of our Society and is always willing to help us when asked. Thank you, Mr. Leslie.

Again the Society is very much indebted to The Winnipeg Supply & Fuel Company Ltd., and radio station CKRC for sponsoring so many programs.

The program committee was under the chairmanship of Mr. H. A. Green, who did a splendid job. Let me here thank all those who so generously gave of their time and knowledge in writing these papers.

The Society co-operated again with the Mayor's Victory Garden Competition put on by the *Free Press*. We judged the latter in all the different districts, and the final, for greater Winnipeg.

During the last week in August, we had the pleasure of again opening the doors of the flower show and had a wonderful display of flowers, fruit and vegetables. It was indeed a success and I should like to take this opportunity to thank the Directors, donors and all the exhibitors. It was hard work, but worth while, indeed, and I do hope it will be an annual event. The show was under the chairmanship of Mr. McPhail, whose past experience most certainly showed to great advantage. Mr. McPhail did a good job and I do thank him.

Our work for the Victory gardens most certainly showed its effect at this show. We have never had a finer display of good material.

Our membership is indeed gratifying—exceeding 430 for 1945, and we already have more than 50 at the time of writing this report for 1946.

In writing this report, I think, in fact, I know that a big share of the credit for these good results is due to our good Secretary Mr. R. W. Brown. His work has greatly increased, but he is always willing to help and always gives his best. I think a very special thank you is due him.

Our financial position is, to my mind, very good, particularly after a great show where hundreds of dollars was paid out in prizes. The details, of course, will be in the Secretary's report.

During this year's campaign for membership and for advertising, we had among the directors an outstanding worker. The Board of Directors felt that some gift should be made to show our appreciation for her work. We therefore presented Mrs. Foxcroft with a beautiful china figure.

While canvassing for donations for the Year Book and the show, I found among business firms and industrial concerns, a great interest in the Society, and I take this opportunity on behalf of the Society to thank everyone who so kindly donated prizes and money for these good causes.

As your President for the past year, please accept my thanks for the great honor and privilege of serving you. In leaving Winnipeg and Canada I take with me memories and gifts which I shall cherish all my life. I shall continue to be a member because I will always keep in touch with the friends I have made here. You have all been very kind to me. If you can come to Valley City, North Dakota, please look me up. I shall always be glad to welcome any one of you.

For the Society, I wish all success—for the members, good health and good gardening.

Eric Sochting

BACK EDDIES, BUT EDIBLE

By THOS. O. GRAHAM

Canadian Seed Growers Association, Ottawa

There is often present in the heart of gardeners a desire to specialize in the growing of one certain crop. This may be an unusual crop. Take as an example the case of Mr. B. Barrow of Million, Manitoba. He became an expert in the growing and preparation of the Husk tomato. Now the fruit of the Husk tomato is very like a small tomato, except that it is covered by a dry papery-like husk. Most people consider the Husk tomato of little value, and that it is not edible in the raw state. As you will see later, Mr. Barrow does not agree with the general conception on this point.

Let us consider the findings of Mr. Barrow. He has located four forms of the husk tomato, namely, one with small yellow colored fruits, one with large purple fruits, one with large yellow fruits, as well as a perennial type. He prefers the form with the large yellow fruits. He has found the form with the small yellow-colored fruits to be sweet and palatable when raw, and that it also makes a strawberry flavored preserve. The form with the large purple fruits he has found to be unpalatable when raw, but that it makes a good preserve of gooseberry or possibly green gage flavor. For preserving, the flavor is at its best whilst the fruit is still green, but when fully filling the husk. The perennial form, which is sold as a flower, and is known as the Chinese Lantern Plant, he considers impractical from the edible standpoint.

In correspondence with Mr. Barrow he has never mentioned the Solanberry, which is closely related to the Husk tomato. The Solanberry has little value in Manitoba. Its sphere is in the driest sections of the West. It will provide food under conditions that would hardly allow the tomato a chance to survive. The Solanberry cannot be consumed in the raw state, and to those who have access to plenty of food, it would not be considered with relish even when skilfully prepared. The uninitiated may at times purchase forms of the Solanberry under such appetizing terminology as the Garden Huckleberry, Garden Blueberry or Wonderberry.

Another vegetable that has been carefully studied by individual gardeners in the West is the vine known as citron. Now that sugar may soon be less scarce possibly a reminder that citron still exists may not be amiss. It is sold generally as red seeded or green seeded, but few know that there are black seeded forms growing in the Canadian West.

Two men who in the past have worked with the black seeded form are Mr. Frank Simon of Melville, Saskatchewan, and Mr. Godfrey Youck, Section 10, Duval, Saskatchewan. Mr. Youck states they make good pickles, and Mr. Simon states from his experience that for preserving or the making of marmalade that the type he has on hand is superior to all forms, and that he has tested everything within his reach, including the green and red forms.

The black seeded form is the giant of the citron family, and is one of the hardiest of vine crops. Mr. Wm. Breakey of Morden, Manitoba, has grown fruits of the black seeded form up to eighteen pounds in weight.

Up to the present examples have been mentioned where parties have specialized in individual vegetable types. Let us now consider an example where a man has experimented with thousands of vegetable varieties. He brought these into his garden from all over the world. Whether this man survived the war is not as yet known, as he carried out his work on a large scale at Warsaw, Poland. His name is Mr. B. Buza. He kept his finger on the pulse of vegetable happenings, and through his kindness Western Canada received many valuable new types. It is fitting that his contributions receive mention.

The most valuable variety Mr. Buza sent to Canada was a cucumber known as the Earliest Green. He stated that it had no equal where earliness is concerned, which is likely to be correct, as he had tested many stocks that had drifted south into Poland from Russia. It is surprisingly early.

In muskmelons he was responsible for two valuable varieties being introduced into the Canadian West, namely Northern Honey Sweet, and Edible Gold, the latter having come into his hands from France. Northern Honey Sweet was the first muskmelon with good quality to be practical over wide areas of the prairie. The Edible Gold variety is in a different category. It can only be ripened in a few of the warmer sections of the West, but those who succeed in ripening it successfully will experience a flavor that will long be remembered. The description Mr. Buza gave this delicacy is as follows:

"Considering only the ideals of fragrance, sweetness, and eating quality, I claim this one to be probably the best in the world, equalling any of the fancy fruits of tropical and sub-tropical zones . . . Entirely distinct from anything grown in U.S.A. or Canada."

One non-staking tomato, namely Polar Circle, was forwarded by Mr. Buza to Canada. It is probably the roughest variety sold in North America, but it has one redeeming feature in the fact that it is the earliest ripening of all fairly large sized tomatoes. If you wish ripe tomatoes in your home garden while these are still being sold in the stores at a high price, Polar Circle is early enough to solve your problem.

So far we have only dealt with vegetables, but in the field of fruit growing there are also men who are taking pleasure in studying a particular branch of this field. Two such men in Manitoba are Mr. W. J. Boughen of Valley River, and Mr. Albert Spangelo of Morden. Both these men are searching for native plum trees at the northernmost fringe where wild plums are known to grow. As a matter of fact their work has accumulated the first accurate knowledge as to where this northern fringe actually exists. Before the importance of the work of these two men can be gained it is best to look back over past efforts to push good plums into prairie territories.

The first move of significance to Manitoba in reference to the improvement of the plum was made close to 1880 when Luther Burbank at Santa Rosa, California, brought plum seedlings from Japan and by crossing and recrossing combined many different types producing such valuable Californian varieties as the Burbank, Red June and Shiro.

The next move of importance to Manitoba occurred when Dr. N. E. Hansen, noted South Dakota horticulturist obtained at Stonewall, Manitoba, an outstanding wild plum in the well-known Assiniboine variety. Thomas Frankland, an amateur experimenter of Stonewall first collected this large native Manitoba plum in 1895 and brought it to the notice of Dr. Hansen. He took the Assiniboine variety and crossed it on the delicious types that Luther Burbank had created in California. However, it is very seldom that the Hansen-Burbank hybrids, where the prairie is concerned, can go any distance north of the American boundary. A few years later Professor Alderman of the Minnesota Fruit Breeding Farm near Minneapolis also commenced to cross native plums on Burbank's delicious large-sized hybrids. These Alderman-Burbank hybrids stand even less chance of crossing the southern portion

of the Western Canadian boundary than the Hansen-Burbank hybrids.

Right up to the present time, with all the crossing that has gone on between native plums and the plums of California, Stonewall in Manitoba has been made the northern boundary from which native material was received. Stonewall is only 24 miles from Winnipeg. Wild plums extend many miles north of Stonewall. Yet, in the country north of Stonewall, no material has so far been obtained and crossed successfully on the delicious fruits of California. In other words the hardiest has so far not been successfully crossed on the best. The main reason back of this fact is that from approximately 1900 to 1937 Dr. Hansen became intensely interested in plant exploration work in Russia and Manchuria and this glued the interest of hybridists to plum varieties coming from this territory.

During the years when work on hardier Manitoba plum types had lapsed one man continued the search for native plum varieties that would fit into northern culture. This man is W. J. Boughen who, as previously stated, lives at Valley River, Manitoba, which is a few miles north of Dauphin. He collected wild plums all through the Dauphin area. He has fairly well established in his territory the northern boundary past which wild plums cannot be obtained. His northernmost finds were collected on Mink Creek a few miles west of Slater, up on top of the Duck Mountains.

In 1937 Dr. Hansen had a conversation with Mr. A. Spangelo who, as previously stated, resides at Morden, Manitoba. As a result of this meeting Mr. Spangelo decided to investigate the Interlake region of Manitoba, and to ascertain the northern extremity at which wild plums survive in that territory. Since then he has gathered native plum material at many sections of this region, and has found that native plums are growing approximately 85 miles to the north of Stonewall. He has fairly well established the fact that it is unlikely that native plums will be found north of Plum Lake, which is drained by the Mantagao River, approximately 25 miles south of Sturgeon Bay on Lake Winnipeg. The terrain in which he has gathered his best material is low and swampy and can only be worked over with difficulty.

The co-partners of Dr. Hansen, namely Mr. Boughen and Mr. Spangelo now have on hand stocks with enough hardiness probably to drive future hybrids with Burbank material another one hundred miles farther north. These three men have opened up the next important step toward giving Man-

itoba plums of a size and quality that would approximate Californian types. This move will very likely make Winnipeg a practical centre for the growing of plums with commercial value. Just consider that in 1895 Dr. Hansen first collected the Assiniboine variety in Manitoba. Fifty years later in 1945 he is still working on the problem of giving Manitoba a decent plum. In his search for suitable material this remarkable man has carefully combed two continents. After over fifty years of hard effort success would appear to be just on the threshold.

Now that peace has arrived there will not be the same incentive to garden for patriotic reasons. Mention has previously been made to work with such garden types as the Husk tomato, citron, wild plums, etc. Such examples as these might be considered the back eddies of horticultural activity. Possibly such back eddies are a partial answer to the problem presented by the lack of interest in gardening that may be caused by the dawn of peace. Here many may receive, as in the cases cited, the necessary spark that will inspire them to continue in horticultural pursuits. Certainly those who become interested in the back eddies will not compete with the many young men who at present plan to face the future in the canning, florist, or market garden industries.

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HYBRID TEA and HYBRID PERPETUAL ROSES

WM. GODFREY, Head Gardener,
Dominion Experimental Station, Morden, Manitoba.

To the rosarian the name rose has a fairly wide application, but to the layman and the gardener it is at once and without effort associated with the roses which are the subject of this discussion.

In garden parlance and in titular order they are known as H.T. and H.P. roses.

The blooms, which are almost unique, in that they combine substances with grace and fragrance, are known to all as the Queen of Flowers.

They are grown extensively in all temperate climates and so great is their appeal to sentiment and tradition that their cultivation is attempted where conditions are less than favorable.

With a few exceptions, all roses are native to lands of moderate temperatures, and the species which have been brought into combination to produce these modern roses are more or less tender to cold and unhappy when subjected to high temperatures. These extremes of cold and heat are encountered on the Canadian prairies, so that only moderate or partial success can be expected. To control or at least to mitigate these adverse influences is a necessary task and a constant care.

To help in an understanding of the position of the rose and its possibilities in the prairie provinces the following account of experiences gained at the Morden Experimental Station is related briefly.

The rose garden was planted in 1925 with approximately one thousand roses of various types, but H.T. and H.P. varieties predominated. Good growth was made and a satisfactory performance in flower production was recorded during the first ten years or so. This statement applies more actually to the H.P. than the H.T. group. At the present time, except for the odd plant or two, the H.P. varieties are still living while the H.T. sorts have all been replaced by younger plants of the same sort or newer varieties. The one exception to the last named is the variety Gruss an Teplitz which, although generally listed as an H.T. is not so in the same sense as those of more modern introduction.

To favorable weather and youthful plants can be attributed the early success of these plantings. A period of dry years beginning in 1929 was a time of trial, and there has been a decline in vigour dating from this date.

Regarding cultural methods, the matter of winter protection has received most attention. This has been provided by placing a mound of soil around each bush to a height of 12 inches, and covering with straw to a depth of 2 feet. The soil is placed in position before freeze-up and the straw applied after the ground is frozen. The reason for this procedure is to get the soil on while it is friable or workable, and to delay the straw covering until mice have selected a winter home elsewhere. An additional safeguard against these rodents is to place tin cans on their sides among the straw containing a few spoonfuls of gopher poison-treated wheat.

The plantings would have benefitted by an application of water during the dry periods of most seasons but the available supply has never been sufficient to irrigate adequately. It cannot be said, however, or proved, that ill-health or winter tenderness was affected one way or the other by lack of water.

In this historical account of the Morden project, the two important facts to remember are the need for winter protection and the relative hardiness of two types of roses. From the fact that the H.P. section has survived the years almost intact it would appear that they are very much hardier than the H.T. section. This is true only to a certain degree. They both kill-back severely, and to a point well inside the soil mound protection. Occasionally there will be a substantial amount of live growth to produce a large bush when growth becomes active, in the case of the H.P., but the H.T. varieties will be reduced to a few basal buds resulting in a much smaller plant. This regular winter kill-back seems to have a devitalizing effect on the H.T., and after a few years they succumb. The length of life will vary with the variety and in individuals within a variety.

The relative merits of these two classes of roses may be appraised as follows. The H.P. is hardier, has only a limited season of bloom lasting from about mid-June to the end of July, and is more vigorous. It was the rose of gardens before the advent of the H.T. Now considered as something in a sense as old-fashioned it has fallen in popular esteem. There being a meagre demand, propagation by nurserymen has been

neglected and it is not easy to obtain. It is the most reliable for prairie growing, and it is worthy of note that in a recent survey conducted by the American Rose Society the H.P. variety Frau Karl Druschke stands at the head of the list of popular roses in the United States. A selection of six of the best sorts would include the above mentioned which is pure white, and Capt. Hayward (carmine), Mrs. John Laing (pink), Ulrich Brunner (red), Fisher Holmes (crimson), and Mme Gabriel Luizet (rose pink).

The H.T. is the modern popular rose of the day. It is the rose of the florist and the fancier. It has a greater range of colors, including yellow shades, which are lacking in the H.P., and it blooms either constantly or intermittently throughout the season. But it is tender and short-lived. There appears to be a considerable range of hardiness in varieties, and those mentioned here are the ones which have stood up longer than average. Etoile de Hollande, Gen. McArthur, Lady Ashton, Margaret McGredy, Ville de Paris and Contessa de Sastago. New and improved sorts are being introduced so rapidly that older ones are soon out-of-date. The intending planter (keeping in mind the fact that they are short-lived anyway) should be guided by a good rose grower's catalogue, and make his choice from those he can afford.

Much has been written in respect to special and elaborate preparation of the soil for roses, but nowadays it is generally accepted that any good well cultivated soil, preferably of a loamy nature, will grow roses. The site should be well drained, where water will not stand in the early spring. Vegetable garden land which has been manured and cultivated regularly is excellent, and well rotted manure should be applied to land which is considered to be lacking in humus. When well established, liquid manure or a balanced fertilizer will be beneficial. Bone meal is not favored in alkaline soils.

Pruning is done in the spring and not in the fall and is a simple matter of cutting the growth back to live wood and eliminating entirely old stubs. Sucker growths from the understocks should be looked for and cut out cleanly at all times.

All these garden roses are grown on an understock and it is necessary that the grower be aware of this, so that he may be on the alert to remove all growths that are produced from the root. If allowed to grow they will rob the plant proper of nourishment and eventually kill it. This sucker growth is

distinguished by the difference in leaf characters. The leaflets are much smaller than those of the variety budded on it.

The two great enemies of the rose grower are plant lice and the Black Spot disease. The first named will appear in June on the young shoots and should be attacked with a nicotine sulphate spray. The leaf spot may not appear, but if it does, dusting with a mixture of 9 parts of colloidal sulphur to 1 part arsenate of lead at regular two weeks' intervals throughout the season will be needed.

It is known that a great many roses are being planted each spring without much knowledge of their possibilities and this has been written with a view to supplying some information as to what can be expected.



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The USE of TREES and SHRUBS in LANDSCAPING the HOME GROUNDS

By PROF. F. W. BRODRICK

In this postwar period there will be a growing interest in the possession and improvement of homes in both town and country. Associated with this sense of ownership is a very apparent desire to make these homes both comfortable and attractive within and without. Today, home grounds' planning and planting are subjects which are very much alive with our people everywhere.

The satisfaction that will be experienced in the development and the ultimate completion of a home grounds' plan will depend very largely on the thought that is given to the arrangement and composition of the various constituent planted parts of the plan itself.

Good landscape planting calls for some artistic appreciation. The landscape planter makes a skilful use of the various classes of growing material such as trees, shrubs and herbaceous plants to give expression to the artistic features of the completed plan. The need for the preparation of such a plan before extensive planting is done is very apparent. A general outline would include the more important features of the completed scheme. This would comprise lawns, specimen planting, border and foundation planting, herbaceous borders, rockeries, garden furniture, service areas, vegetable garden, and walks and drives. With a definite objective projected into such a plan, the work of development may be extended over a number of years. This would allow for the completion each year of the amount of work that circumstances will permit.

In the development of such a project consideration may be given to the introduction of a number of fundamental landscape principles which have an important bearing on the success of the finished plan. It is the object of this short paper to review some of these and point out the application that may be made of them in working out the plan.

One of the most important of these is the question of style. Under western conditions the style that has proven most adaptable is one which is termed naturalistic. In this

style an attempt is made in any planning that is done to copy as far as possible the method of grouping that is followed by nature.

Naturalness may be introduced in a number of ways. One method is to plant trees and shrubs in groups or clumps of varying character and size according to their nature and the space they should occupy. Naturalness may be introduced further by following a type of arrangement which is referred to as border planting. This method regards the home as the centre of the picture, while the trees and shrubs are planted around it in such a way as to provide a natural setting for this central feature of the whole plan. The use of free flowing lines where borders or beds are developed, and the placing of trees and other material in such positions that the varied forms of the plant and the varied color and texture of foliage and flower are shown to the best advantage, all add to the spirit of naturalness. A greater variety of plant material may be introduced into the plan. Hardwood and softwood trees, shrubs in variety, and hardy herbaceous material may be introduced, and all will take their place with good effect in the general planting scheme.

Following out this plan on grounds of limited extent, the heavier planting of the larger material is confined largely to the outside of the grounds. This method tends to give a setting to the whole picture. Smaller shrubs such as cotoneaster, spirea and Siberian almond may be used as foundation planting and confined to the base of the building. These serve to tie it to the ground line and soften the rigid architectural lines by rounding out the square corners. Shrubs are most suitable for this purpose, although herbaceous material may sometimes be used.

The space between the outside borders and the foundation planting will be more or less an open area which may be utilized as a lawn. A very important feature in any well planned home grounds is the development of a good lawn. It creates a setting for the whole home picture and provides a suitable basis for the tree and shrub planting and any other ornamentation that may be desired.

Scattered at suitable positions over the lawn may be specimen trees and shrubs as Colorado blue spruce, American elm, weeping birch, Siberian crab apple or well trimmed specimens of flowering shrubs, such as improved varieties of lilac, honeysuckle, mock orange and flowering almond. Fre-

quently their individual beauty may be enhanced by planting them against a background of groups of trees or shrubs with dark or suitably colored foliage.

Trees and shrubs may often be effectively used for wind-break protection and as screens for shutting out undesirable views or for the purpose of hiding unsightly objects or buildings. For the purpose of screening, those of compact growth and heavy foliage are most desirable. For the purpose of wind protection, trees or shrubs of bushy compact but flexible character, such as the introduced willows, are found satisfactory.

Taking into consideration the various uses to which trees and shrubs may be put, there are other factors that are well to consider in selection of materials, such as winter hardiness, drought resistance, and general adaptability to site and surroundings. These are characteristics which are desirable in all plant material used in the development of any landscape plan.

Again reference may be made to a principle which was previously mentioned, namely, variety. This is demonstrated in the use of varied plant material. Variation introduced in form of plant, in texture of branch and color of bark, in texture and color of foliage, and in form and color of bloom, all add to the attractiveness of the completed scheme.

Associated with variety is the principle of unity, which finds expression in the care that is shown in the selection of material that is chosen for each position. It is further demonstrated in the skill that is shown in developing a well blended composite whole.

It can be stated that landscaping is a progressive undertaking. A knowledge of materials coupled with an ability to use them to the best advantage permits of the development of attractive tree and shrub planting schemes with the attendant pleasure derived from a work well done.

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HEDGES

By W. R. LESLIE, Dominion Experimental Station,
Morden, Manitoba

A hedge is a live fence made of trees, shrubs or vines. Untrimmed hedges are being planted on an increasing scale as field shelters on prairie farms. These temper winds, trap snow and modify the evaporation of moisture from the soil. They also play a part in preventing, or at least in lessening, the drifting of surface soil. Along Manitoba highways the traveller sees many dozens of miles of caraganas, willow, box-elder, spruce, lilac, cherry and other hedges, partially trimmed, to regulate the formation of winter snowdrifts. However, this essay deals primarily with clipped hedges employed on the home grounds to provide shelter, to form a screen in front of unattractive views or to mark boundaries.

In general, it is noted that hedges are dwindling in popularity. The present trend is to have an open front on one's town or city estate. The absence of a hedge or fence increases the depth of the frontage and enhances the character of the main feature of any home property—the house itself.

The home maker, having decided on building a hedge, he is obliged to consider the when, the what and the how.

Planting is best done in April on well-tilled, freely-drained, mellow soil of moderate fertility. If uncertain as to the subject to use, he is urged to inspect various kinds growing at neighbors, or at Experimental Stations. A demonstration of over 100 kinds of hedges is maintained at the Modern Experimental Station. A short discussion of some popular materials will be made shortly.

A single row is preferable to a double row. The fact is that a double row is usually bad gardening. It tends to become unduly wide, is difficult to keep clean and presents a cavity when one plant dies out. Spacing will vary from 6 inches for very low dwarf hedges as Pigmy caragana to 2 feet for evergreens such a spruce. Ordinary caragana is usually spaced at one foot. The most common spacing for deciduous materials is 1½ feet. Usually plants are headed back to a height of four to six inches at planting time. The purpose is to induce dense

side shoots arising close to the ground. A satisfactory hedge will be dense from the soil surface to the top. Leggy plants not beheaded will fail to be bushy at the bottom as the policy of woody plants is to grow upward and thus outstrip competitors in seeking direct sunlight. An exception is coniferous evergreens. They only require removal at the terminal growth or leader.

Cultivation is such that there be a strip of tilled ground at least two feet wide on each side of the plants. Old plantings will benefit from occasional dressings of rotting barnyard manure, leaf mould, grass clippings, or a mixture of top soil and acid peat which is enriched with a handful of ammonium phosphate for each two feet of hedge length.

Shearing is done in late June when the height of spring growth has been attained. Evergreens are kept in desired bound by one trimming about mid-July. For a short time the wounded branches are unsightly but a secondary growth of side branches soon covers these. Some of the vigorous deciduous hedges such as Cherry prinsepia and Siberian elm will require two or three or four shearings to keep them in desired trim.

Hedges that have been permitted to get out of hand, are coppiced back to within 6 or 8 inches of the ground in mid-April. The rampant new growth may rapidly be shaped so that the hedge is rejuvenated in a season to pleasing form.

There are many shapes of hedges. The conic form, suggestive of the outline of a narrow Black spruce tree, is probably most fully satisfactory. This inverted V-shape results in a distribution of sunlight, encouraging healthy growth of low branches. Moreover, it involves having only two surfaces to shear, and enables the gardener to suppress the width of his hedge. The conic contour is in harmony with Nature and is restful to the eye.

Materials: One of the satisfactory hedges comes from clothing a page wire fence with Native grapes. Planted about 2 feet apart, a four-foot wire fence is furnished the second season. A merit of this hedge is its narrow width. Another is the supply of winter bird food its berries afford.

Very Dwarf Hedges or edgings, from 8 to 12 inches; Dwarf Euonymus (*Euonymus nanus*) and Pigmy caragana. These little pony hedges may be of rectangular shape without hurt to low branches.

2 to 3 Feet Hedges: Tibetan crabapples, Verna barberry, Thunberg barberry, Spiny caragana, Hedge cotoneaster, Poiret barberry, Alpine currant, Siberian currant, Wild gooseberry, Skunkbush sumac, Bush cinquefoil, Garland Spirea and Scotch rose.

4 Feet Hedges: This height may be supplied by those shrubs mentioned in the last class. Other materials deserving consideration include European and Peking cotoneaster, Vanhoutte spirea, Coral dogwood, Silver buffaloberry, Saskatoon, Altai rose, Cherry prinsepia, Chinese lilac (*Syringa chinensis*, preferably of reddish bloom), and Tidy caragana.

5 Feet Hedges: Paper birch, Native plum, Hawthorn in variety of which the Fleshy, Fireberry, Cockspur and Chinese (*Crataegus pinnatifida*) are particularly useful; Amur maple; Siberian elm of Manchurian or Siberian origin; Hungarian lilac; Russian olive, Tamarack; Siberian larch; White spruce, Colorado spruce, Rocky Mountain juniper if not within 200 yards of hawthorns, so that both species may avoid Cedar Rust disease, and Swiss Stone pine.

Tall Hedges: To form screens or hedges too tall for clipping without climbing devices, a number of materials are approved. Among them are Siberian elm, American elm, Nannyberry, Amur lilac, Russian mulberry, Laurel willow, spruce and pine in variety.

Aside from all of the above are the two most widely used hedge plants on the Canadian prairies—Caragana or Siberian peashrub and Common lilac. Each is readily established and each is durable. Their popularity is on the wane. This is due to their common-placeness, to Caragana tending to become defoliated in August, and the suckering habit of this species of lilac.

Among the thorn or spine-bearing subjects are the barberries, roses, Spiny caragana, hawthorns, buffaloberry, prinsepia, Ussurian pear, Native plum, and Tibetan crabapple.

Conspicuous winter bark is seen on hedges of dogwood, birch, Siberian currant, Amur maple, European cotoneaster, Tibetan crabapple, Redstem willow, Yellowstem willow and Amur tamarisk.

Fruits cling on into winter on roses, buffaloberry, hawthorns, cotoneaster, Viburnums, buckthorns and Russian olive.

Fortunately there is a wide choice of attractive hedge materials adapted to prairie fields and gardens.

ANNUALS in RAILWAY GARDENS

By J. R. ALMEY
C.P.R. Horticulturist

The development of this work has yearly been towards the planting of more annual flowers and fewer perennials. This is no doubt due to the fact that the aim in fostering these gardens is to produce a bright, colorful display of bloom for as long a period as possible in a given area. It is unquestionably true that the impression of beauty is more often of color than of form. Annuals have met this requirement as no perennial has been found to accomplish under Western Canadian conditions. Shrubs and trees are used for their landscape effect, mostly background, and protection against wind injury.

The principals behind the use of annuals in railway gardens apply almost equally as well to the home garden.

In selecting kinds of annuals to plant it is better if we make note of what we consider goes into the make-up of a good annual. The following six characters at least must be considered:

1. Continuous bloom.
2. Hardy against light frosts.
3. Sun tolerant, drought resistant.
4. Orderly in growth.
5. Wind resistant (low and compact).
6. Obtainable in a wide range of colors or dependable for definite colors.

Should the reader carefully analyze the above and apply it when making his selections he cannot go far wrong. Without number one, any annual is sadly lacking for most purposes. Seed production or maturity in an annual usually slows up its propensity to bloom, and usually spells its doom. When seed can be picked off the period of bloom can be extended, but it is not always applicable. It is not my intention at this time to deal with annuals for cut flower purposes, but mainly for their landscape value.

The definite location of planting in mind must be linked with the kinds of flowers to be selected, and such locations as extensive borders surrounding a lawn; formal beds; foundation planting; elevation of beds and aspect, allow different kinds to be used to better advantage. Kinds that do well in an open

sunny location may, when planted against a building foundation with western exposure, be a complete failure. Air currents assisting in the former as against the reflected heat from a building foundation in the latter mean the difference between success and failure. Snapdragons twenty feet away from a building are a success, whereas against the foundation with western exposure are a complete failure. Not so Verbena, as it will be a success in both locations.

Take beds of dwarf bedding Dahlias or most composites with daisy-like heads—to approach a bed of these from the south the effect is most excellent, but if viewed continuously from the north their effect is quite dismal. Kinds with this type of flower “head” follow the sun or face south for the greater part of the day. The effect of the light nodding heads of Ursinias may be spoilt if so located that prevailing winds turn their heads away from the usual approach to their location.

The planting on raised banks or terraces as against in sunken gardens are diametrically opposite. In the former the flowers, if viewed from a lower level must have their flowers arranged along the stem as in Snapdragons, Stocks or Clarkia, whereas in the latter position Calendulas, Phlox Drummondii, or Zinnia, when seen from a higher level are at their best, but not so if in the former position.

Large deep borders with a background of shrubbery allow for kinds with variable heights, allowing greater scope to the planter to bring about desired effects.

Together with what has already been briefly considered the facilities available for growing the plants from seed must be given consideration. If the seed must be sown where the flowers are to bloom, kinds suitable for that purpose must be selected. If hot beds or cold frames are available more kinds can be grown. Without greenhouse facilities it is practically impossible to make a success of many kinds.

Before coming to the list of kinds we have found to be the best, one should also give consideration to the knowledge one has of raising plants. The true amateur would in all probability make a complete failure if he tried to grow Lobelia or Nemesis from seed, but with a packet of Zinnia or Larkspur his first attempts would meet with some success.

With due consideration to what has already been said, we find the following kinds as groups to be our best:

Petunia—Unbeatable, in a class by itself.

Stocks—Next in order.

Snapdragon, Salvia, Phlox Drummondii—Three with about equal qualities.

Verbena	}	Arranged in order of preference, but under suitable conditions are all equally good.
Marigolds		
Dianthus heddewigii		
Nemesia		
Pansy		
Viscaria		
Ursinia		
Dimorphotheca		

Lobelia	}	For edging to flower beds, the latter three for foliage only.
Alyssum		
Tagetes		
Ageratum		
Cineraria Maritima		
Matricaria		
Pyrethrum aureum		

Zinnia	}	A group for sowing outdoors in the ground where they are to bloom, arranged in order of preference. A good selection for the beginner.
Clarkia		
Nasturtium		
Larkspur		
Portulaca		
Cornflower (J.G.)		
Phacelia		
California Poppy		
Candytuft		

Many may be disappointed in seeing some of their favorite flowers so low in the list. The Petunia, however, has so many points in its favour that we have found little to compare with it. Except in districts of heavy summer rainfall it is easily the leader. It is hardy against light frosts in the fall, and will continue in bloom from mid-June until severe frosts destroy it. In the early part of the season it will set some seed, but not in sufficient amount to check its flowering. It delights in lots of sunlight, and will do well in districts of light rainfall. It is not particular about soil types. Suitable types are not injured in exposed windy locations. It does, however, lack two colors, namely yellow and red, so for yellow we depend on snapdragons, and for red on Stocks, Snapdragons and Salvia. We

place Stocks ahead of Snapdragons because a good strain has a large percentage of doubles, which set no seed, and is not troubled from time to time with rust as in the Snapdragon. In recent years with the general development of dwarf early varieties the *Salvia* has taken a lead for red color schemes and has in many gardens ousted the *Geranium*. *Phlox drummondii*, especially the dwarf compact varieties as *Fireball*, *Meteor* and *Snowball*, enable one to follow color schemes with a very easily raised plant. The seed is so large that few fail to make a success of this. It is frost hardy, sturdy in growth, its only weakness being the likelihood of seed production to slow up its flowering. We like the *Verbena* because it stands the heat well, and the blue varieties find a place that combines this color with other desirable characters.

Before closing I must draw your attention to the fact that I have not until now mentioned varieties. Within the kinds so dealt with are hundreds of varieties. The careful selection of the best for one's needs is imperative. For instance in *Petunias* we favour the type as depicted in *Celestial Rose*, a dwarf compact single plain petal variety, very floriferous. When mixtures are used the large grandiflora singles are used, as these are only used in very large beds, and the fact that they are tall and straggly in growth is then no drawback. We rarely use the double or ruffled giants except for window boxes as they lack effect when used for mass color schemes.

Space will not permit me to deal with color arrangements and color schemes. This is a study in itself, and one in which the gardener can yearly plan colored garden pictures to his hearts content and mental enjoyment.

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HOW to FLOWER DUTCH BULBS SUCCESSFULLY

By HERBERT SULKERS

Sulkers Greenhouses, Winnipeg

With the arrival of hundreds of thousands of Dutch bulbs from the Netherlands as gifts from our Canadian soldiers at present in Holland, to their relatives and friends in Canada, much interest in bulb culture has been revived. Not that it had died down, but due to the war it has been impossible to import Dutch bulbs for the last six years, and the few grown elsewhere were entirely insufficient to supply the demand.

Since the sixteenth century when many countries became literally tulip crazy, and when in Holland very large sums of money were offered to any man developing or breeding new colors in tulips, the popularity of these early and colorful spring flowers has ever increased. So much so that the annual turnover in bulbs now amounts to millions of dollars. The reason they are so popular is perhaps largely due to the fact that no other flower can quite take the place of the tulip, daffodil or hyacinth, because of their earliness of bloom, the mass of color they produce, and the easiness of their culture. If your bulbs are healthy, as they mostly are, and given the right treatment, success is easy to obtain.

Bulbs ordinarily arrive early in September but this year, 1945, some of the shipments of bulbs were retarded due to the uncertainty of shipping space, and other difficulties.

Tulips should be planted in late September or early October for outside planting. Almost any soil will grow good tulips, but in our heavy clay soils they prefer a little sand mixed in to provide better drainage if you have it handy; if you have not, they will not fail on account of it. A good way to plant them is to make a hole about seven inches deep, or in other words, remove the top seven inches of the space you want to plant with tulips. Then dig the hole over and loosen the subsoil to provide good drainage for your bulbs. If you have sand handy put a half an inch or so on the top of the ground, that is, in the hole, and plant your tulips in that, pressing them down in your loose soil to the top or crown of your bulb

until you have your desired quantity planted. Then fill the hole with the soil you have taken out; in other words fill seven inches of soil on top of your bulbs.

Now you say—how far apart should I plant them? This depends on how many bulbs you have, how big a bed you want to plant with them. Six to eight inches is a good spacing but a little closer or wider is immaterial. The depth is more important. Seven inches is a good depth but as deep as ten inches will not hurt, making your flowering a little later as a rule.

Tulips are planted deep for more reasons than one. First, the deep planting provides much stronger flower stems and longer stems. Second, in planting tulips early in the Fall when we have still an occasional warm day, the deep planting prevents them from making any appreciable top growth and promotes the root growth, which is absolutely essential to all bulb stock. If you plant later in the season, the depth will prevent the frost from penetrating to the bulb and gives it a chance to root before winter sets in. If we plant very late for some reason, it may be necessary to put some covering on the bed of tulips to make sure they will root before freezing. Well rooted tulips are not affected by below zero weather, up to forty below or even more.

Another important factor is the watering which should be done at planting time very thoroughly. If the ground has been prepared as outlined above, there is no danger of over-watering. The ground should be well soaked and if a few leaves, generally easy to get at that time of the year, are put over the top of the bed, the bulbs should be quite all right to go into the winter. The leaves will prevent the ground from drying out. While all tulips and most crocuses are hardy, daffodils, hyacinths, paperwhites, etc., are better kept from freezing and in most Manitoba winters would be killed outside. They provide beautiful flowers for early spring pot plants.

Upon the arrival of the bulbs in the fall, they should be planted in pots. These can be ordinary flower pots or pans anywhere from 3 inches to 6 inches deep; have crown of the bulbs just covered with soil or slightly sticking out. Any ordinary garden soil mixed with some sand will do. Water them very thoroughly, place the pots outside in the garden in a shady place, and cover them with earth or ashes, (one

foot deep) whatever you have handy. If it is ashes, see that it is wet; dry ashes would draw all the moisture out of your pots.

You can leave your pots there until the weather becomes very cold, or say zero. Then take them up and give them a good watering again, put them in a dark cool place in your cellar, and let them slowly come along. A month or so before you desire to have them in bloom in your home, move them to a warmer place, still fairly dark. There let them draw up about six inches in height, then move them to a light and sunny window and they will bloom nicely. When in bloom, do not give them too much heat as that will shorten the life of the flowers. The same method must be used if tulips are desired for winter flowering in the house. With hyacinths great care should be taken to see that the flowers are six to seven inches long before they are brought into the light. Otherwise too short a flower stem may result.

Bulbs such as daffodils, hyacinths, paperwhites and freesias, as well as China lilies, can be grown in water dishes filled with grit or gravel and kept filled with water. The rooting method is similar to that outlined for bulbs grown in soil, only water dishes should be kept in the cool cellar instead of outside until the plant is well rooted in the grit, and should be gradually given a little more heat until brought in the window or on the table for flowering.

Varieties of tulips should be chosen for their color, earliness of bloom, or lateness of bloom. All tulips, that is all different varieties, can be planted in the garden with success. The best varieties, in my opinion, are Darwins and Cottage tulips. It is most essential that they be watered properly and kept in a cool, dark place for rooting for at least one month or six weeks for success. If this is properly adhered to, failure will be an exception.

Tulips planted outside can stay for several years and annuals may be planted over the top of them in summer time.

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LIST of ROCK GARDEN PLANTS

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Name	Colour	Height	Period of Bloom
Achillea Tomentosa	yellow	6"-8"	July-Sept.
Adonis verna	yellow	6"	June
Aethionema	pink	9"	Summer
Ajuga reptans rubra	purple-blue	3"-4"	May-June
Alyssum saxatile	gold	8"-10"	May
Androsace sarmentosa	pink	4"-6"	June-July
Anemone Pulsatilla	violet	9"-12"	May
Arabis albida	white	8"	May
Arenaria caespitosa	white	1"	June
Aronaria Montana	white	6"	June
Armeria maritima alba	white	5"	June
Bellis perennis	pink	8"	May
Campanula carpatica	blue	9"	June-Aug.
Campanula pulliodes	blue	6"	June-Aug.
Campanula pusilla	white	2"	June-Aug.
Cerastium tomentosum	white	8"	June-July
Cerastium alpinum	white	3"	June
Cheiranthus allionii	yellow	12"	July
Dianthus neglectus	rose	6"	June
Dianthus deltoides	pink	6"	June-July
Dianthus plumarius	white	12"	June-Aug.
Draba aizoides	yellow	3"	May
Dryas octopetala	white	4"	June
Erinus Alpinus	rose	3"	June
Erigeron auranitiacus	orange	8"	June
Gentiana Acaulis	blue	6"	June
Gentiana lagodechiana	blue	4"	July-Aug.
Geranium sanguineum	pink	8"	June-July
Gypsophila repens	pink	6"	July
Heuchera sanguinea	scarlet	12"	July-Aug.
Iberis tenoreana	lilac-white	9"	July
Iberis sempervirens	white-evergreen	9"	July
Iris pumila	blue, yellow	6"	May-June
Iris cristata	lilac, blue	4"	May-June
Leontopodium alpinum	white	6"	June
Linaria alpina	violet	4"	July-Aug.
Linum flavum	yellow	12"	June
Lychnis alpina	red, purple	4"-6"	June
Lychnis viscaria, floro plen.....	rose	12"	June
Myosotis, alpestris	blue	6"	July-Aug.
Phlox, amoena	pink	6"	Summer
Phlox, subulata alba	white	6"	June
Phlox, subulata rosea	rose	6"
Polemonium (Jacob's Ladder) ..	blue	12"
Potentilla, Willmottiae	rose	12"	July

Name	Colour	Height	Period of Bloom
Primula—in variety	various	6"-8"	May
Sagina glabra	white	1"	Summer
Saponaria ocymoides	pink	6"	June
Saponaria ocymoides alba	white	6"
Saxifraga Aizoon—variety	various	4"-6"	May-June
Saxifraga Andrewsii	white	10"	June
Saxifraga cotyledon	pinkish	18"	June
Saxifraga cordifolia	pink	12"	May
Saxifraga lingulata	white	18"	May-June
Saxifraga Wallacei	white	9"	May-June
Sedum acre aureum	yellow	2"	June
Sedum album	white	6"	June
Sedum anglicum	white	3"	June
Sedum eversii	rose	6"	June-July
Sedum hispanicum	white	4"	June
Sedum lydium	reddish	2"	June
Sedum murolis	creamy white	4"	June
Sedum reflexum	yellow	6"	June-July
Sedum scopoli	white	4"	June-July
Sedum ternatum	white	4"	June-July
Sempervivum—in variety	various	3"-10"	July-Aug.
Silene alpestris	white	6"	June-July
Silene maritima	pink	6"	June
Silene schafta	rose	6"	July-Aug.
Stachys lanata	white foliage	12"	Summer
Stachys latifolia	lavender	15"	June-July
Thymus lanuginosus	silvery leaves	3"	Summer
Thymus odoratissimus	pink	4"	Summer
Thymus serpyllum coccineus....	pink	6"	Summer
Tunica Saxifraga	pink	6"	July
Veronica prostrata	blue	6"	June
Veronica repens	blue	4"	June
Veronica rupestris	blue	4"	July
Veronica taurica	blue	6"	July
Viola cornuta	blue	6"	Summer
Viola cornuta alba	white	6"	Summer

Something New...

SPRING ROCK GARDEN COMPETITION

Judging to Take Place in June

. . . Depending on Weather

Garden Meditations

By J. WRIGHT

172 Burrin Avenue, West Kildonan, Man.

As I ramble in my garden,
In a meditative mood;
The flowers all seem to speak to me,
Of the mysteries of God.

As I behold their beauty,
Their various tints and shades;
I'm reminded of the rainbow,
And the promises He made.

That while the earth remaineth
There should always re-appear,
The seed time, and the harvest,
And the seasons of the year.

If I go in early springtime,
All seems lifeless, dark and bare;
But I know beneath the surface,
There's a seed lies buried there.

In that little seed is hidden,
Something man can not produce;
Life! Then it must be God given;
There can be no other source.

Soon in answer to the sunshine,
And the gentle showers of spring;
There's a movement on the surface,
And, behold, a wondrous thing.

Life, and Death, and Resurrection,
Here their mysteries have unfurled;
For our loving Lord, and Saviour,
Gave His Life, to save the world.

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In the beauty that we see;
For we hear the gentle whisper —
That seed gave Its Life, for me.

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NEW VARIETIES of FLOWERS and VEGETABLES

By DR. S. W. EDGECOMBE, Research Director, W. Atlee

Burpee Co., Philadelphia 32, Pa. and Clinton, Iowa

With the end of World War II, gardeners and all other persons think in terms of peace. Thus the new rose, "**Peace**" is rather appropriate. It was granted All American recognition in 1946 and is released to the gardeners this year. This rose was christened at the Pasadena Rose Show just as the San Francisco World Conference was beginning its deliberations. The originator of **Peace** is the famous rosarian, Francis Meiland and perhaps **Peace** is the finest rose that he has produced. In every test garden in 1945, it was a strong vigorous plant, made good growth, and was cold resistant. It is floriferous. The large ovoid buds are yellow, but as they develop, the color changes to a watermelon pink picotee edging the petals. The large peony-like full flowers undergo a transformation of coloring from cream-yellow with pink-edged petals to a delicate over-all flush of pink, which suffuses with the softening yellow as the bloom opens. In summer the yellow tints turn to a creamy or alabaster white. In severe summer heat and at every stage the coloring is rich, clear and clean.

Colossal Shades of Rose, All-American Silver Medal winner in 1946, is one of the most important flower introductions in years. Before the war, all the giant all double petunias came from Japan. No one in America was able to duplicate the feat. However, during the war this secret was learned and W. Atlee Burpee Co., Philadelphia Pa. and Clinton Iowa, introduced two all double petunias to the trade. The first was the carnation-flowered, all-double, mauve pink petunia, **America** which won the All-American Silver Medal in 1943. Much progress and great strides have been made since then and **Colossal Shades of Rose** gives us the largest 100 percent double, strongest and most vigorous petunia yet introduced. Plants grow about 18 inches tall with heavy stems, luxuriant foliage, and under favorable conditions the flowers are four to as much as five and half inches across. The color shades range from light to salmon pink to deep pink and purplish rose.

Another All-American selection for 1946 is **Bright Eyes** (All-American Bronze Medal). It is a dwarf, compact, upright form of nana compacta. It could be called the bedding model of the popular Rosy Morn. It attains the height of about ten

inches. The color is rosy-pink with white toward the throat. **Bright Eyes** is especially adapted to low bedding, edging, window boxes, rockeries and potting, since it stands compactly and requires no supports.

The third All-American flower award is **Peach Red** Petunia (Honorable Mention). This variety like **Bright Eyes** was developed and introduced by the W. Atlee Burpee Co. With its rich salmon-cerise color, it is perhaps the richest salmon colored petunia yet produced. Growing fifteen inches high, it is strong and luxurious, at first spreading, then tends to grow erect. Flowers are plain petaled, medium size about two inches across and borne freely. It is self-colored salmon suffused or overlaid rosy-cerise, and brings a new color to petunias. It is quite different from and larger than Salmon Supreme.

The last All-American flower selection is the new annual dianthus, **Westwood Beauty**. It was developed and introduced by Dr. G. A. Mehlquist, University of California, Los Angeles, Cal. It is of *Dianthus Heddensis* and *chinensis* parentage. It grows ten to fifteen inches tall and in appearance is similar to the large flowered *chinensis* varieties. The color ranges from fiery crimson to a deep velvet red with occasional splashes of lighter shade. It is an easily grown annual of good germination, free-flowering on long wiry stems, with flowers about two inches in diameter, deeply fringed or lacinated; the color is strikingly rich.

The only vegetable winner to be introduced for the 1946 season is a bush snap bean, **Longreen** which received honorable mention. It is similar to **Tendergreen** and **Keystonian**, both previous All-American winners. **Longreen** gives a slightly larger, broader-leaved plant with pods of the same attractive, round, stringless, and fibreless. The pods are an inch longer than **Tendergreen**; plants are hardier and a more certain cropper. The distinct difference and advantage over **Tendergreen** is the longer pods, generally noted by the various judges.

Not all the outstanding varieties of flowers or vegetables are entered in the All-American trials. This year several varieties are offered to gardeners which apparently have real merit.

Several government institutions and at least one commercial firm have been working with tetraploid snapdragons. The first introduction is a mixture, **Tetra Snaps**, offered by the W. Atlee Burpee Co. These are the largest flowering of all snapdragons, 2 to 2½ inches deep and 1¾ to 2¼ inches wide, many distinctly

and attractively ruffled. Every color is seen in this glorious flower plus some new ones. There are shades and variations of bright orange, light orange, peach-orange, rose-orange, bronzy yellow, golden yellow, canary yellow, yellow-flecked red, antique bronze, reddish bronze, pink-flushed yellow, scarlet tipped yellow, scarlet crimson, pinks from apple-blossom to deep rose, pink and white combinations, pure white and others of harmonious tone blendings.

Genetically, **Tetra Snaps**, are tetraploid snapdragons for, when examined under the microscope, one finds that they have twice the number of chromosomes in their cells as regular or diploid snapdragons. They were created by the application of colchicine to the tissues of the diploid snapdragons.

The doubling of the chromosomes not only produces plants with larger flowers but the plants themselves are larger and stronger, trifle taller than diploids, with glossy, dark green foliage, thick and almost leathery in texture; the stems too are stouter.

Waves, a lovely new early flowering Sweet Pea is another introduction of the Burpee Co. It is vigorous, ruffled with a pleasing mid-blue color and fragrance.

Burpee's **Fordhook Tampala** is new for 1946. This is the darkest-leaved selection of **Tampala** now available. It does best in very hot weather when it is superior to **Spinach**.

Burpee Hybrid Tomato is an early mid-season hybrid particularly outstanding for its quality and rich flavor of its fruits. In 1946 it outyielded **Rutgers** and **Marglobe** by 20 percent. The fruits are medium to large, firm, thick walled, average 8 ounces in weight, deep globular in shape, scarlet-red in color; flesh is meaty and rich in flavor in comparison with other popular varieties. It may prove to be a valuable tomato for the home garden, market grower and for long-distance shipping. It is of later maturity than **Fordhook Hybrid** tomato being 70 days to maturity.

The following list of vegetable varieties are some that have proved promising in one or more trials in United States. Not all are available at this time to gardeners for trial, so those not available are marked with an asterisk.

Asparagus

***Washington Hybrid Strain**—Dr. T. M. Currence, University of Minnesota. Favorable reports on yield.

Beans

***Cherokee Wax**—Dr. W. C. Barnes, South Carolina Experi-

mental Station, Charleston, S.C. Adapted to the south since it is heat resistant.

Celery

Cornell 19—Yellows resistant, self-blanching, becoming increasingly important in New York State and other regions.

Cucumber

Cubit, Associated Seed Growers, New Haven, Conn. An outstanding variety in regard to fruit shape, size, small cavity and crispness. Plant size relatively small. Reported to be especially susceptible to Angular Leaf Spot.

Marketeer, also introduced by Associated Seed Growers, New Haven, Conn. It is gaining popularity in the southern part of the United States since it has a dark green fruit color which is very superior to the color of the commercial varieties.

It has a strong "female" tendency and under favorable conditions will produce a bumper crop.

Onion

California Red No. 1. Developed by the United States Department of Agriculture under the direction of Dr. Henry A. Jones, Beltsville, Md. It is especially adapted to certain regions in California.

Pepper

Merrimac Wonder — Developed by Dr. Hepler of New Hampshire Agricultural Experiment Station, Durham, N.H. This pepper is early and very prolific and appears to be adapted to northern regions of United States and Canada.

The above list is an abbreviated list of the new flower and vegetable introductions. Some selection has been made from the standpoint of Manitoba gardeners on the basis of adaptability to Manitoba conditions and some selection on the basis of interest. Certain lines of future development have been indicated in these introductions, such as, F. hybrids in tomatoes, cucumbers, asparagus and onions, earliness as in the Merrimac Wonder pepper, improved commercial value as with Cubit and Marketeer cucumbers, disease resistance as in Cornell 19 Celery, heat resistant with Cherokee Wax bean. These few examples indicate what the gardener may expect in ever increasing number in the immediate future now that war-time restrictions are becoming fewer and fewer.

NORTHERN GREAT PLAINS MEETINGS

By PROF. E. T. ANDERSEN

Assistant Professor of Horticulture, The University
of Manitoba, Winnipeg.

(From excerpts of article in November issue of the
Country Guide.)

In 1918 a group of enthusiastic prairie horticulturists, both from Canada and the United States met at Mandan, N.D. The object was to establish better organization and close working relationships between men engaged in similar problems of fruit and garden. Out of the success of this meeting developed the Great Plains Section of the American Society for Horticultural Science, which ordinarily meets yearly to discuss the mutual problems of members. Owing to difficulties in travelling it was not possible to have meetings during the years 1942-44.

Last summer's meetings at the Minnesota Agricultural Experiment Station, St Paul, were thus the first since 1941, and because of the many new developments were extremely interesting and worth while. Under the able guidance of Dr. W. H. Alderman, Chief of Horticulture at Minnesota, and his staff, interest was kept at a high level at all times. In the scope of this short article it is possible to touch on only a few highlights of the three-day program.

A field in which keen interest was shown was in the use of selective weed poisons. This method of weed control, still in its infancy, shows definite signs of having far-reaching possibilities with garden crops. In a test at the University Farm several different types of light weight oils had been sprayed on asparagus beds. The oils were applied after the cutting season. Ordinary range or heating oil was found to be most satisfactory and resulted in an almost perfect control of such weeds as purslane and various pigweeds. Unsprayed areas were crowded mats of weeds. Kerosene was effective, but resulted in some injury to the asparagus plants.

Weeds in onions and carrots have also been effectively controlled in this way with very little or no damage to the crops.

Results of the new wonder weed killer for dandelions in lawns 2, 4-D (2, 4-Dichlorophenoxyacetic acid), now so much

in the news, were also displayed. As found wherever tried, this chemical sprayed on lawns heavily infested with dandelions resulted in a complete kill of the weeds in two to three weeks from the time of spraying. The grass in the treated areas showed no injury whatever. The chemical is a growth substance or hormone and is effective against most broad leaved plants. Work at Minnesota has shown that other chemicals similar to 2,4-D are even more destructive to weeds. The effect of these chemicals on vegetable and grain crops is still largely a matter for exploration. The next few years may bring about many changes and short cuts in weed control methods.

The use of hybrid seed is another extremely interesting phase of the vegetable work at Minnesota. Hybrid seed of corn is now well established and its merits recognized by growers. The advantages of hybrid seed lies in the increased vigor obtained in the plants which gives, in turn, yields far exceeding that of ordinary varieties. Work at the University Farm, St. Paul, would indicate that it will be only a short time till hybrid seed of many of our vegetable crops will be in common use. Yields showing a 70% increase were obtained with squash and cucumber hybrids over similar types of ordinary varieties. Yield increases of one-fifth to one-third were obtained with hybrid tomatoes. Although hybrid seed of tomatoes and cucumbers are already available commercially, it may be some time yet before hybrids which are well adapted to western prairie conditions are developed.

As well as giving increased yields, some of these hybrids will have other special features such as resistance to disease. Cucumber hybrids introduced by Burpee Seed Company were able to withstand wilt in the trial grounds at the University Farm when all other varieties suffered severely.

A tour of the flower plantations illustrated the color displays possible with the new hardy outdoor hybrid chrysanthemums. Breeding work at Minnesota has already yielded a large number of outstanding selections, nineteen of which have been named. A number of these will likely prove hardy enough for use on the Canadian prairies.

A tour of the 230 acre Minnesota State Fruit Breeding Farm revealed extensive progress in breeding for hardiness and quality in many fruits. Peaches, plums, apples and cherries were ripening. A crop of peaches is rare on the prairies even in Minnesota. A number of varieties of prune and damson

plums were maturing a fine crop of fruit. Haralson apple introduced by Minnesota about 20 years ago showed up to good advantage. Several new high rating numbered selections are soon to be introduced.

Advance in equipment for freezing and storage of fruits and vegetables in the home is rapidly putting this method on a practical basis for the family unit. A mechanical pea sheller which will also handle soybeans and other shell beans may soon relieve the householder of the drudgery of shelling these by hand.

Many other useful ideas and discoveries were disclosed, but cannot be dealt with in the scope of this article. Brief mention should be made, however, of the already famous insecticide, DDT. Its use in Minnesota shows it to be perhaps the best insecticide for potatoes known today, giving good control of Colorado potato beetle, flea-beetle and leaf-hopper. DDT on cabbages was found much superior to arsenical poisons. In addition to its control of cabbage worms and flea-beetles a definitely invigorating effect was manifest in the plants. Plants treated with DDT showed far more vigor of growth than where other chemicals were used. This effect was also noted, but to a lesser degree, with potatoes.

Pests over which it offers little control are aphids and red-spiders. Where these become troublesome, they will have to be dealt with by other means. There is also as yet little information on how it will affect leafy vegetables for human consumption. Much remains to be learned about the behavior of this chemical and its possibilities.

A steering committee was set up under the chairmanship of Dr. Alderman to act as a guide in bringing together information on special problems. Information obtained in this way should prove very valuable for discussion at later group meetings. The Executive for 1946 will be headed by Dr. L. E. Longley, University of Minnesota, Chairman; Dr. M. F. Babb of the Cheyenne Horticultural Station, Wyoming, Vice-Chairman; and Mr. John Walker, Forest Nursery Station, Indian Head, Saskatchewan, Secretary.

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HOME GROUNDS COMPETITIONS

By W. R. LESLIE, Dominion Experimental Station,
Morden, Manitoba

Opinions vary. This fact accounts for horse trades—and for a large proportion of all business transactions. However, it is possible to appraise general landscape values in such a manner as to win approval from majorities. Judges may give different weight to the several features which go to make up individual Home Grounds in doing their judging. The following discussion aims to analyze the chief considerations in appraising the various places in a competition.

Two score cards that have been made in Manitoba are reproduced herewith. A third suggested score form follows, with explanatory comment, purposing to express a point-of-view and giving the reasons therefor.

(1) Score Card for HOME GROUNDS

(Extension Service, Manitoba Department of Agriculture)

Walks and Drives

Location	7
Character and Condition	8

Lawns

Location and Outline	5
Condition	10

Plantings

Arrangement	15
Materials	25
Condition	15
General Appearance and Neatness	15

Total	100
-------------	-----

(2)

HOME GROUNDS

(Manitoba Horticultural Association, 1942)

Lawns (15)

a. Density and Uniformity of Turf	5
b. Freedom from Weeds	5
c. Condition, colour, upkeep, location	5

Landscape Design (40)

a. Harmony or arrangement (proper use of areas, lawns, trees, shrubs, flower beds, vines, pools, rock garden, accessories)	15
b. General Appearance (attractiveness, balance, colour, floriferousness of flowers)	15
c. Suitability to Site (suitability of design to lot. Use of walks and drives, trellis and fences)	10

Variety and Material (25)

a. Suitability of material used (best use of kinds and varieties of trees, shrubs, flowers, etc.)	10
b. Balance of Variety (proper amount)	10
c. Interest (continuity, season)	5

Maintenance and Condition (20)

a. Proper Maintenance (upkeep, pruning, removal of dead bloom, cultivation)	10
b. Vigor and general health of plants	5
c. Cleanliness (freedom from weeds, insects and diseases)	5

Total	100
-------------	-----

HOME GROUNDS

Dominion Experimental Station, Morden, Man.

General Appearance (as viewed by persons passing by)	20
Balance, neatness, interest.	

Walks and Drives	10
Location, outline, composition.	

Lawns	15
Location, composition, density, evenness, purity, edging.	
Plantings	
1. Arrangement	15
Harmony, balance, placement.	
2. Material	25
Variety, durability, succession in bloom, fruit, foliage and bark, of beauty, autumn and winter effect.	
3. Condition	15
Well-being through considerate pruning; thriftiness or vigor; health or freedom from pests and faulty nutrition; sanitation, or freedom from weeds, dead parts and debris.	
Total	100

This last score card outline for judging Home Grounds is simpler with only six columns for rating. If adequate to do justice to the candidate, its brevity should be welcomed.

It starts off with **General Appearance** as viewed by the citizen passing the property. Each home is a component unit making up the residential sections of the city or town. Hundreds of people will pass by to one who enters the grounds. For that reason, this preliminary score, made from without the boundary of the property, seems desirable, as it notes the impressiveness which the estate contributes to the district. In general, the grounds that are unmarked by a front fence, hedge or other barrier are considered a friendly part of the community. Moreover, the grounds give the impression of extensiveness as compared to a similar property flanked by a hedge or other obstruction. Much importance is placed on the interest commanded by the shape, colour and nature of the house, the beauty and general attractiveness of the plantings, lawns and other subjects in view.

Walks and Drives are placed for convenience, and only to that minimum which will satisfy the needs of the household. Many homes have an undue area taken up with wide walks and drives. Tinted walks are preferred to those made of glaring white concrete. All should blend with the house which must necessarily be the chief feature of every home grounds.

Lawns are very important. The grass area is considered akin to the surface of a lake of green. The border plantings of trees, shrubs, vines and flowers form the shore line and banks. The more even, uniform, dense and green the turf and the more trim its edging the higher will be its score. A mixture of grasses and clovers, or admixture of weeds and coarse grasses such as Couch and Brome, are demerits. The outline is natural if it conforms to that of a lake or pond.

Plantings. The arrangement is to be such that a harmonious picture results. Crowding is to be avoided. The front of the property is mostly open with trees and shrubs growing from the front corners of the house and not more forward than two-thirds of the distance to the sidewalk. Foundation planting is to be of shrubs and not so dense but what the portions of the foundation are in view at several intervals. Flowers alone against the basement wall is not approved in Manitoba where their period of bloom is so curtailed by early cool autumn nights. When the flowers have collapsed, the otherwise bare ground is bleak for about eight months. Tall shrubs or trees against the front of the house are out-of-place. Flowers for cutting are to be in the backyard garden.

Materials are to be obtained that will afford variety of color, texture and form; that will retain health and charm through the years—for examples Oak, Elm and Ash are preferred over Boxelder or the so-called Manitoba Maple; and Korean is more desirable than Vanhoutte spirea); and that will provide landscape beauty at all periods of the year — including the dormant season when evergreen foliage, winter berries and bright bark on select shrubbery will be feature attractions. Garden accessories such as summer-houses, benches, swings, hammocks, pools, fountains, running water, bird houses and feeding stations, weather-vanes, gnomes, sun-dials, and other furnishings at times enhance the scene. The test in considering their merit is chiefly in a casual visitor's reaction to them. If they appear to "belong" and if they blend in with their neighboring furnishings, they contribute credit in the scoring. Frequently these garden adjuncts do not fit and hence rate as a demerit.

Condition of plantings is gauged by general health; cleanliness; thriftiness, as revealed in vigor of new growth, and full intensity of foliage color; and natural well-being resulted from approved pruning and training. It is very important that ornamental shrubs and trees be allowed to develop their

branches in outline that is typical of the subject. A shrub or tree with its top shorn to a rounded or unusual shape imparts a jarring effect that makes for landscape discord. A spruce tree with its lower branches loped off is in the same category. Any plant anaemic through faulty nutrition causes a discount of the grounds. Where lime content of the soil is overly high it is wise to avoid planting Rugosa roses, Amur maple or those spireas and other plants which are susceptible to lime-induced chlorosis. Finally a home grounds is a landscape picture. Masses of 3, 5 or 7 plants of a kind are usually more pleasingly effective than a collection of various individuals. A wide range of single plants grouped closely together is seldom good landscape gardening. Clipped hedges at best are somewhat artificial. If planted it is well to choose a conic form to which to shear or shape them.

Adorning one's home grounds probably is the most widely practised, as well as one of the most intriguing hobbies of mankind.

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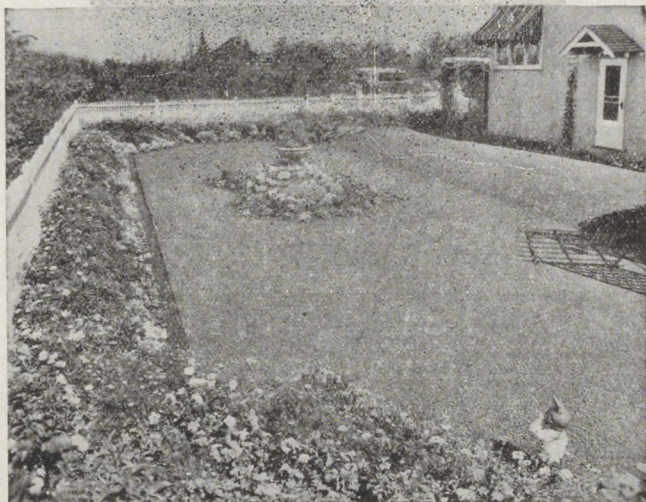
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HOUSE PLANTS

By THEO. E. HOWARD

Antenbring's Greenhouses, Winnipeg

There are certain house plants that thrive in a hot, dry room. Some that require very little water. Some that like all the sunlight you can give them. There are others that prefer indirect light. Some that like a cool temperature. Some that require frequent waterings. Some that want a moist atmosphere and so on. It will readily be seen, therefore, that it is almost impossible in Manitoba, especially in winter, to have a great variety of plants in the same home, as very few homes are adapted to serve plants with all these different requirements. Hence some of your plants do better than others and some that you have difficulty with may thrive in your friend's home where other conditions prevail. I have even heard it said that some plants look beautiful in a greenhouse, but when they are purchased and brought home they go to pieces. I have even heard people say, "The greenhouses must dope them up. If we only knew how they do it we could have nice plants also." Such is not the case. The secret is none other than that a greenhouse has facilities for changing the heat, humidity, etc., to suit certain plants and this is not possible in the average home. A greenhouse company has several houses. Some are kept cool, some hot, some moist, some dry and so on. Naturally if you select a plant in a greenhouse that comes out of a damp, cool house and put it in your hot home with dry atmosphere, it will not survive the shock.

Some people have the idea they cannot grow plants because they have gas in the house. If your canary or your plants show effects of gas, then it is high time you had your gas installations inspected for it may at the same time be affecting your own health. With the modern system of installation there is no reason whatever why you cannot have plants. If your gas equipment was installed some years ago and you cannot grow plants then something is wrong. Apart from plants altogether and if only for your own good have an inspection made immediately and the trouble corrected. Many greenhouses in the west are heated entirely by gas, yet these firms have no trouble growing all sorts of flowers and plants simply because the heating system is properly installed. Experts have instruments that

will show immediately if any gas is escaping. If so, apart from plants, altogether, your health is being impaired.

In the following paragraphs I have tried to give you the various conditions under which different house plants succeed best so that according to conditions prevailing in your particular home, you will know which will do best. If you have air conditioning you can possibly succeed with a larger variety. In addition to this, there is also the various treatments that different plants require. Take for instance the Calla Lily.

CALLA LILY

At the first meeting of the Winnipeg Horticultural Society last fall, Mr. Herb Sulkers told a story which is well worth repeating. It ran something like this. A woman had been given a Calla Lily by a very dear friend. She thought a great deal of it, but although she had had it for some years it never bloomed. Like our "next year farmers" she hoped that next season it would bloom. It did not. But in another year it surely would bloom. One summer she had occasion to go away and left instructions with her husband to be sure to water it and look after it. Hubby forgot. Being a free lance, at least for a whole summer and his own boss for a while at least, other matters were given his attention until one day he thought of the Calla. The pot was full of leaves when his wife went away, but now it appeared to be on its last legs with neglect, as all the leaves had died down. Fearing he would be in the dog house on his wife's return, he happened to look out the window and saw it was starting to rain. He would put the plant out and the rain would surely revive it. So he took it out and placed it over on one side of the back yard. Again he forgot about it. One day about a month or two after he again thought of it. He went out to look at it. The wind or a dog or something had knocked it over. This time it was absolutely dead, so he thought, as not a leaf was showing. However, he decided to bring it in and water it and see if it would sprout again. It did. His wife came home. A few leaves were showing, but best of all there were some stems and flower buds showing. Yes, it bloomed — the first time since she had received it. Said her husband, "The whole trouble is you did not look after it yourself. With the care I gave it I got it to bloom, which is something you could not do." Not knowing the details, his wife came to the conclusion that her husband knew more about plants than she did and immediately instructed him, much to his chagrin, to look after all plants in future. When the hus-

band told the story to a friend who happened to be a horticulturist, he found out that through accident he had done just exactly what was required. So now you see if your Calla always has a lot of leaves and if you keep watering it and do not give it a chance to rest, you will get no bloom. In other words, if you want bloom, then do as the husband did.

Not more than one tuber should be placed in a six inch pot — three tubers in a nine inch pot, using a rich soil made up of two parts of old cow manure, one part sharp sand, two parts loam, two parts leaf mould and a seven inch pot of bone meal to each bushel of the mixture. Keep the pots at first in a cool, semi-dark spot and do not over-water. In two or three weeks the roots will be well started and the plant should then be given a light, open place, but not in the glaring sun that comes through a window. Give it plenty of water. Calas do best if given liquid fertilizer as soon as the pots are filled with roots and if the application is increased after the flower stocks appear. Winter temperature in your home at night should not fall below fifty-five degrees. Nor should it be much above sixty-five degrees. After the blooming season is over, do as hubby did, or better still, a few weeks after the bloom is done, take the tuber right out of the pot and let it rest or dry before re-potting for the next season's bloom. To sum it up—If your Calla Lily carries a lot of leaves and no bloom, now you know why.

AMARYLLIS

Technically a South African bulbous herb, family Amaryllidaceae. Requires practically the same treatment as the Calla Lily. Take up the bulbs and store in a cool, frost free, dryish place. In early spring or even as early as January re-pot, using two parts sharp sand, two parts loam, two parts leaf mould, half part dry cow manure and one five inch pot of bone meal to each bushel of the mixture. Place in a good, indirect light with a night temperature of sixty-five degrees or more. Water once a fortnight with liquid manure, especially toward blooming time. After the plant blooms it is important to remember that it must be watered and fed so that the leaves will develop properly and that the bulb will ripen sufficiently to permit safe storage. This can be done in the old pot if you wish, gradually allowed to dry out or they may be placed in clean, dry sand. Do not, however, allow them to shrivel. If your pot of Amaryllis is full of leaves and kept growing, you will as in the case of the Calla Lily, get no bloom.

BEGONIAS (FIBROUS)

Most species are derived from plants of moist, hot forests. Naturally they thrive best in a greenhouse that approximates these conditions, and to make the best growth and produce the finest foliage, demand them. Notice, for instance, the fine large plants in the conservatory in City Park where ideal conditions prevail. Many of them, however, will tolerate a reasonably warm, preferably moist, living room, especially forms of Rex Begonias. If you have a fish aquarium in the sun room, the moisture from the tank will help considerably. All begonias when in active growth are gross feeders and require plenty of liquid manure, but when growth stops, they require a short resting period during which water is reduced and feeding entirely stopped. After new growth begins they may be re-potted in two parts sharp sand, two parts loam, two parts leaf mould, half part dry cow manure and one five-inch flower pot full of bone meal to each bushel of the mixture.

BOSTON FERNS

These do best in indirect light and away from a sunny window. In general the night temperature should be a minimum of fifty-five degrees with a rise of ten to fifteen degrees during the day. Extremes of heat and cold should be avoided, especially cold drafts from open doors during the winter. Standing water must never be left in the pots' saucers. Never use fresh commercial fertilizer. Watch closely for signs of pot binding and re-pot often, say every spring. Must have perfect drainage and sweet soil. Use two parts sharp sand, two parts loam, two parts leaf mould and one half part dry cow manure. It is claimed that left over tea diluted and lukewarm is good for ferns. Keep soil moist, but not sloppy. Every month sink pot in bucket of water and water from the bottom for one hour. Boston ferns should be stood on a high fern stand and placed in a corner of the room where the leaves will not be knocked about by people passing to and fro. Boston ferns will sometimes become infested with scales if the room is too hot and dry. If a fern or any plant whatsoever becomes sick or infested with pest, isolate it at once before your other plants become involved.

CACTII

It is not primarily heat that small, fancy cactii require, but dryness of atmosphere and plenty of fresh air. Humidity and water at the roots cactii will not stand. Plenty of drainage is

imperative and potting mixture is two parts sharp sand, two parts loam, one part pieces of flower pots broken very small, half part leaf mould and one five inch flower pot full of ground limestone to each bushel of the mixture. A moderate watering, not more than once a week, is all that is needed. If over-watered, no plants will rot as quickly. Don't forget that you are dealing with a desert plant. If making a cactii window garden, do not transplant each individual plant, but fill the container with sand and plunge each individual plant, small pot and all, right in the sand.

With the Christmas Cactii, however, the above does not apply. These plants need more water, especially at blooming time. In the summer, they should be placed outdoors, the same as hydrangeas and forgotten about until fall. When rested in this way and brought into the house before the first frost, they will bloom more freely.

CINERARIA

This is a very widely grown greenhouse plant forced into a profusion of bloom, especially in the late winter or early spring. In the home they must be kept cool at night, not over fifty degrees and not over sixty degrees in the daytime or they will be quickly spoiled. Should never be placed in a sunny window. Need lots of water when in bloom. After blooming the plant may be discarded as it is then through. This plant is regarded more as a glorified bouquet and is splendid for a centrepiece.

CYCLAMEN

Cyclamen will rot if drainage is not good. On this account it is important that they be planted in fairly light soil, being sure that broken crocks or stones are placed at the bottom of the pots before planting. Should not be placed in windows with bright sunlight or near a hot register, as they do better in a fairly cool temperature and in indirect light. A west or north window is ideal. When through blooming they should be rested. Cut down extensively on the watering, or the bulb can be taken out of the pot, wrapped in paper and kept in a dark, cool place for two or three months and then replanted.

FUSCHIAS

Sometimes called "Lady's Ear Drops." Propagated each year from soft wood cuttings, rooted in pots. Require same soil as

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hydrangeas and temperature of fifty to sixty degrees. Best plants are procured by pinching top of stem, thus forcing them to bush out. All branches should be cut back after current blooming season, then plunged outdoors in the shade (see hydrangeas). Most important disease is rust, determined by the appearance of yellow, orange or reddish-brown powdery postules on the leave stems or buds of infected plants. The spores produced in these postules are carried by air currents to nearby healthy plants where new infection occurs. Dusting sulphur is about the most effective fungicide. The first application should be made before infection has occurred since rust is difficult to control once it has gained much headway. Fuchias are also subject to white fly. No spray is satisfactory. Place plant in a tight, cardboard box or large paper bag, tied tight, into which is placed one-quarter of a teaspoon of cyanide and leave for one-half hour. This should be done out in the yard. Under no circumstances should cyanide be used in the house. It is deadly poison and if you get the fumes in your lungs it is fatal. It should really be used only by professionals or experienced fumigators. It is, however, about the only thing that will effectively destroy the white fly.

Many people ask what flowers will grow in the shade or on the north or west side of house. Many with houses fronting north or west do not bother with window boxes because geraniums and the like do not usually do well. Here is a good substitute. Fuchias not only do well in the shade, but along with fillers look very nice indeed in a window box. For a house plant there are a great many varieties — some are very beautiful. The American Fuchsia Society welcomes those interested in the flower. Write Garden Editor, Houghton Mifflin Company, Boston, Mass., U. S. A.

SANSEVIERIA

Bowstring Hemp, also called Snake Plant and Leopard Lily, and even by some people known as "Mother-in-Law's Tongue." Is a species of the lily family, native of Africa and India. Do not require sunlight. Propagated by divisions of the root stock in early spring or leaves may be cut into pieces about three inches long and inserted in sand in a temperature of fifty-five or sixty degrees when a new root stock will form. Water very sparingly. Ordinary potting soil is all that is required. I have often heard it referred to as "the lazy man's plant," probably for the reason that it seems to thrive if more or less neglected.

GERANIUM

What is commonly known as the garden geranium is really a *Pelargonium* and is labelled such in European countries. Out here they are all known as geraniums, both by gardeners and the general public, although botanically they are not geraniums, but the name has been in use so long that it is doubtful if it will ever be discontinued. "How can I keep my geraniums over from one year to another?" is a question very often asked and one that is extremely hard to answer on account of our weather conditions, because in an ordinary home one has not the proper facilities for doing this. In a greenhouse with good, overhead light and proper humidity and temperature it is an easy matter. In a greenhouse slips are taken throughout the winter and in this way a large stock can be built up, but in a home the temperature is usually too hot and the air too dry. Perhaps the best method is to take them up in the fall and plant them rather thickly in a box. Water sparingly or stem will develop stem rot and die. About December or January cut them back to about four inches. Pot into small pots using same mixture of soil as with hydrangeas. Good drainage and firm potting is essential, so press the earth down well around the stem with thumb and fingers. When six or seven inches high, pinch out top of shoots to make plant branch, more flowers being obtained by this method. When cutting off the tops of the old plants, good, firm side shoots can also be selected and rooted. Avoid sappy growths. Cut diagonally one quarter of an inch below a knuckle and insert in a mixture of one-half sand and one-half soil in two-inch pots, and after rooted and planted, water well. If plants in the window are pinched at the top, they will grow bushy instead of growing up three or four feet and looking like telephone poles.

A few ivy leaved geraniums are splendid for the outer edge of a window box, as they hang over and make a splendid showing.

HYDRANGEA

A pretty safe rule with all plants is: the more the bloom the more watering is required. Especially is this the case with Hydrangeas, as with their large, heavy blooms the plants can be watered two and three times a day. Once allowed to dry out, the plant is practically ruined. When through blooming the plant should be allowed to rest. Cuttings can be taken in February or March or even later. Start them in shallow boxes or pans over gentle bottom heat (or window sill over hot water

register is alright) and when rooted, plant in small pots, using one part sharp sand, two parts loam, one part leaf mould (or humas) and one-half part dry cow manure. Mix one five-inch flower pot full of bone meal to each bushel of mixture. Then bury the pot up to its rim in soil in a shady place outdoors or in ashes, sand or moss. Use common — not glazed pots. See that the plunged pots do not dry out and give them an occasional dose of liquid manure. By September they are ready to plant in eight-inch pots. Keep in cool place until January, then increase heat to fifty or sixty degrees when they should be ready to flower by Easter. Plants that have just stopped blooming can be carried over to the next season if treated in the same manner, but these never produce the same satisfactory blooms as fresh cuttings do. Pink flowered specimens may sometimes be changed to blue by putting bits of iron or alum in the soil.

SAINTPAULIA

(African Violet)

Named after Baron Walter Von Saint Paul who discovered the first species. Many people have the idea that these must be watered from the bottom. Such is not the case. This idea, no doubt, got around from the fact that this is the best way to keep water off the leaves, for wet leaves will spot and spoil the appearance of the plant. This can be avoided by watering with a kettle or anything with a spout. Should be grown in a north or west window. If in an east or south room, keep away from direct sunlight or heat of glass window. Will not succeed in dry air, as they like moisture. Not necessary to feed with artificial fertilizer. Good soil, a mixture of one part sharp sand, one part leaf mould, half part well rotted cow manure, two parts loam or finely pulverized sod soil will supply all that is necessary. Keep soil moist by watering with lukewarm water. Require good drainage. Never let them stand in saucers of water continuously, as this will sour the earth and cause trouble. Some plants will not bloom. In this case, put another root in with it and the chances are this will be corrected. Never re-pot when in bud or bloom as this will set them back. It is best to pot them after they have finished blooming. Bloom best if crowded in the pot and if they look too crowded, pinch some of the leaves right down at the bottom of the stem, rather than re-pot. There are several varieties, the best of which is Blue Boy, although Sailor Boy and Amethyst are very nice. Propagated from the leaf.

POTTING SOIL

Everyone going in for house plants should make it a point to set aside a small place in their basement and keep on hand the various ingredients needed for any sort of plant. Get a small bag of sharp sand from any sand company, but be sure to tell them you want sharp sand for potting. Then go out to your garden and fill a box or a bag of good garden loam. Take a bag with you and when you are out in your car go into a bush and fill it with leaf mould. When you do this just skim it off the top for as a rule leaf mould is only three or four inches deep and if you go below this you are liable to get sand, clay or gumbo. Then take a bag with you and drive into some dairy farm and get them to fill it with dry cow manure. Now buy a few pounds of bone meal and keep all these items separate so that when you do any potting you can mix the portions according to the particular requirements of the plant you are potting and when you mix, be sure to mix thoroughly.

Liquid manure is best prepared as follows. Take a small flour or sugar bag and fill it with cow manure. Tie the top of the bag. Insert this in a small pail or tub of water. When you want to use it, lift the bag up and down in the water two or three times. Pour off the brown liquid and mix it with equal parts of ordinary lukewarm tap water, and it is then ready for use.



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WHAT is YOUR SUCCESS with POTATOES?

By L. A. YAGER

Research Assistant, University of Manitoba

The difference between growing good potatoes well and simply growing potatoes is something worthy of much thought and consideration. The potato crop is subject to a large number, and more severe forms of destructive diseases than most horticultural crops. And to the average grower the insect question is in itself serious enough. Dealing with this last point, the average grower considers the Colorado potato beetle as the supreme insect menace of the potato crop. But, to the grower of Foundation and Certified seed and to the agricultural scientist, the smaller insects like flea beetles, aphids and leafhoppers present much more serious difficulties than the former. Why? . . . because they spread disease.

Probably the three most destructive types of diseases in potato crops in the last few years are bacterial ring rot, late blight and virus diseases. Bacterial ring rot is now considered to be the most serious disease of potatoes to date, at least in this country. It is a disease of European origin which found its way into Canadian and United States seed stocks in recent years. The fact that one plant found infected with bacterial ring rot in a field of potatoes grown for certification renders the field ineligible gives some idea as to the importance and seriousness of the disease.

It is an insidious disease once it enters the seed stock, for it will infect the seed and may perhaps increase for some time unnoticed and without showing external symptoms. To clean up a stock that has once become infected is the job of an expert, who should have technical advice and assistance. It is a big job which requires extreme patience, and extreme precautions regarding sanitation at all times. Where this disease is a factor, the adage "an ounce of prevention is worth a pound of cure" holds immeasurably true.

The advent of late blight into the province in the past few years, now presents a very serious problem to potato growers. Its seriousness in this part is probably due to one factor besides moisture. It is that growers in this area are relatively unacquainted with proper control measures.

Late blight is a wet weather disease and is not a factor in dry years. In some districts, even where control measure have

been applied, the continuous wet weather made control ineffective and at times impossible. Bordeaux is usually a highly effective treatment and its use should be encouraged where potato growing is carried on and especially in years when late blight is prevalent. Bordeaux, too, is an excellent repellent against flea beetles and leafhoppers which spread virus diseases and also cause some foliage damage.

Late blight epidemics usually start from piles of discarded potato tubers and dissemination of spores by wind from then on is very rapid. The point that should be remembered regarding this disease is that an epidemic is started by wind dissemination of spores, and that planting even the very best of seed does not guard against an attack of this disease. Once started, the disease **can be controlled only by spraying or dusting** with Bordeaux or other prepared copper compounds.

The disease can be eradicated in a district only if all growers co-operate by destroying all cull or discard potatoes either by burning them with lye or burying them. Even with such precautions, wind disseminates the spores from long distances and the chance of infection in a wet year is rather good.

Like bacterial ring rot, viruses too are tuber borne diseases. Also, growers can remain almost entirely free of them by planting Certified seed, or seed one year removed from certification.

The entity causing virus diseases is so small that it cannot be seen by the ordinary microscope. Many of the potato virus diseases are very infectious also and can be passed on to healthy hills simply by contact or spread by sucking insects like leafhoppers and aphids.

The expression of "running out" of a potato is primarily due to these diseases. Many of these forms of disease escape notice of the average grower, but can be detected in careful inspection. With some exceptions, virus diseases do not adversely affect the physical appearance and quality of the potato tubers, but they do reduce the yield very materially in some instances.

There are four types of virus diseases that are of economic importance in Manitoba. They are leaf roll, spindle tuber, mosaics in their many forms, and purple top.

Leaf roll, as the name implies, causes an upward rolling of the leaves of the plant, and in severe cases stunts the growth. The plants in general are a lighter green color than normally. Spindle tuber may cause a more upright habit of plant growth

and the infected tubers are more elongated in appearance than normal. Mosaics may cause, in the milder forms, only scattered light green areas in the leaves, but in the most severe forms will cause distinct crinkling and stunted growth. Purple top is somewhat variable in its expression, sometimes causing only dwarfing of the growing tips, or sometimes extreme purpling or discoloration of only the growing tips of the plant, or even a greater part of the plant.

All these virus diseases are notorious in causing reduced yields in potatoes. With the exception of late blight, the diseases discussed here can be controlled by using only the cleanest, best seed available.

Clean potato seed is not just seed that looks good judging from the appearance of the tuber itself. It means much more than that. The plant from which each tuber came bears testimony of the value of the tuber itself for planting as part of the next year's crop.

If the plant from which the tuber was borne becomes infected with a virus disease during the season for example, most probably all the tubers from that hill will carry the disease to the next year if planted. Being a virus disease, the tubers themselves probably won't show any noticeable symptoms, and so a casual inspection of tubers alone will not give any clue whatsoever to their value for seed.

Seed grown for certification must pass two careful inspections for disease during the growing season. Except for late blight, Certified seed is the only kind that gives a grower a high degree of protection from these diseases. Next year, make your potato crop produce as efficiently as possible. To help do this, make sure that yours is the best kind of seed obtainable.

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LIME-INDUCED CHLOROSIS

J. E. MACHACEK, Dominion Laboratory of Plant Pathology,
Winnipeg, Manitoba

For many years, trees, shrubs, herbaceous ornamentals, and other plants in Manitoba have, in certain locations, developed shoots bearing yellowed leaves which became scorched during the heat of summer. Often, only few individuals in a planting showed this condition. Badly affected plants did not fruit, and were found very susceptible to fungus and winter injury.

This disease, popularly known as Lime-induced Chlorosis and usually most conspicuous in wet years, is the result of a deficiency of assimilable iron or manganese in the plant. This may be caused by a deficiency of these elements in the soil, but, in Manitoba, it seems to arise from the fact that the elements are present in an insoluble form either in the soil or in the plant and in that form they are unavailable for use by the plant. This unavailability occurs chiefly where soils are alkaline, and, since lime or limestone are nearly always found in alkaline soils, the name for the disease is quite apt.

As the disease has been known for over fifty years, a number of remedies have been developed. Resistant crops and varieties have been recommended, but lists of these are scarce and not always applicable to Manitoba conditions. Spraying of the foliage with a 1 percent solution of citrate of iron, or of sulphate of iron acidified with citric acid has been frequently found to give rapid relief, but at least three sprays at 10-day intervals are required and the effect lasts only during the current year. Swabbing pruning wounds and the bark, while the plant is dormant, with a 25 percent solution of either of the above materials has given the normal green colour during the following year. In orchard areas, lime-induced chlorosis has been controlled through the digging of trenches or the punching of holes in the soil under the trees and the placing of crystalline sulphate of iron on the bottom of the trench or into the holes. A total of about one-half pound of the chemical was required for each inch in tree diameter. A grass cover crop among the trees also proved to be beneficial.

In recent years, investigations have shown that reducing the soil alkalinity yielded very promising results. Soil alkalinity was reduced in three ways: (1) by incorporating a liberal

quantity of partly-rotted manure with the soil, (2) by the incorporation with the soil of acid peat, and (3) by the application of sulphur to the soil. Decomposition of the manure liberates carbonic acid gas the presence of which in the soil tends to make it less alkaline (at least temporarily), while the manure also makes the soil porous, allowing soluble alkalis to percolate into deeper soil strata. Acid peat has an almost immediate acidifying effect and also allows the leaching of alkalis. Sulphur oxidizes into sulphur dioxide which, in combination with water, finally becomes sulphuric acid. This acid neutralizes alkali minerals. With decreasing alkalinity, bound iron and manganese become available to plants and their normal green colour is restored. With established trees or shrubs, where deeply-located roots are not affected by surface treatments, holes, punched or bored into the soil around and beneath the trees, may be packed with acid peat soaked in a 25 percent solution of sulphate of iron, or a 50-50 mixture of sulphur and sulphate of iron may be put in each hole. As previously mentioned, the total amount of sulphate of iron should not exceed one-half pound for each inch of trunk diameter.

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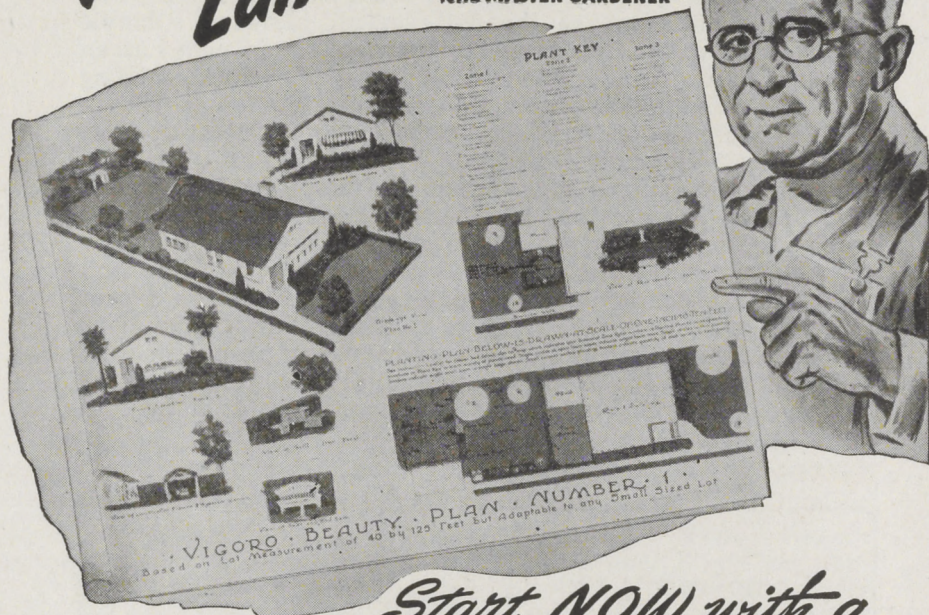
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PREVENTING GARDEN DAMAGE by MICE and RABBITS

By G. D. MATTHEWS, Superintendent,
Dominion Experimental Station, Scott, Sask.

Gardeners, on the Canadian prairies, can take little relief from the fact that, for the most part, usually only two of over a thousand species of rodents found in North America attack their horticultural plants. However, either mice or rabbits can be so destructive in their silent damage that growers of fruit and shrubs must be constantly on guard and must take action to curb their activities. Amateur gardeners have frequently become discouraged and many have abandoned growing fruit because attention was not given to the control of rodents, thus preventing ruinous losses.

The damage from both mice and rabbits varies greatly from year to year, depending on their numbers, food supply, the weather and possibly some unknown factors. Damage usually starts when the weather becomes cold in the fall and, while it continues during the winter, they seem to be more destructive with the first signs of spring weather. This suggests that means to prevent injury should commence in early fall and continue through till spring, depending upon the counter measures adopted.

Some observations have been made on the kinds of crops damaged. Mice will damage many horticultural crops including tree fruits, nursery stock, small fruit and shrubs, although in orchard trees they seem to prefer bark of apples to that of cherry. Rabbits have a wider range of preference if there is abundance of material on which they can feed. However, where a grower has only a few specimens it is possible to take special precautions. In order of preference rabbits preferred apple or crab, plum, cherry, willow and only a trace of damage was found on poplar and elm when these were exposed in a test of repellants. Rabbits prefer new wood which means that most young trees require protection. One must take precautions against rabbits on such shrubs as flowering or ornamental crabs, Flowering Plum, Red Elder, Mockorange, Cockspur Thorn, Amur Cork Tree and Swiss Stone Pine.

For most crop hazards one does not rely on one precaution, but practices all known aids with emphasis on those remedies

best adapted for the condition concerned. This is equally true when considering damage from mice and rabbits.

An excellent way to discourage mice around trees or shrubs is clean cultivation. Cleaning away grass or other surplus vegetative growth will discourage their presence. A circle of clean land around trees and shrubs helps the growth of trees on the prairies and also discourages mice. A mound of soil or coal ashes around a tree will often keep mice away. Even when such precautions have not been taken before winter comes if tramping is done around trees after each snow fall mice can be prevented from working beneath the snow.

Often the most satisfactory way to control field mice is by poisoning, but extreme care must be exercised in preparation, labelling, storage and use of poisoned baits by responsible persons only. A starch-coated grain bait with strychnine can be prepared for use in the garden. This is made by mixing a level tablespoonful of laundry starch in a quarter cup of cold water and adding three-quarters of a cup of boiling water to make a thin paste. An ounce of baking soda and an ounce of powdered strychnine sulphate are mixed and then stirred into the starch paste until a creamy mixture, free of lumps, is obtained. Stir in a quarter pint of corn syrup and a table spoon of glycerin or petrolatum. This is mixed thoroughly with twelve pounds of wheat or sifted rolled oats and the poison is ready for use.

Indiscriminate scattering of poisoned bait is not effective for field mice. It should be used where fresh signs of mice are evident. This work should be commenced in the fall along surface runways. Pieces of tile or inverted small boxes with holes in each end or other conventional containers may be used for poison stations.

In the case of rabbits, poisons while often easier to prepare may not be very effective and more extreme safeguards are necessary in their use. For example, when carrots or apples with a few grains of strychnine in them are scattered around, there is greater danger for children and animals. Similarly, when a solution of ten grains of salt and one and a half ounces of strychnine dissolved in six ounces of hot water is used to soak small sheaves of alfalfa, the bait must be away from animals and the unused portions gathered up carefully and destroyed.

A wider use of two-inch mesh poultry netting is in evidence to enclose small prairie fruit plantations as an effective method of controlling damage by rabbits. It is preferable to have such

a fence five feet high and, if permanently placed, should be carefully inspected each fall for openings in the wire or along the bottom of the fence. Where periodic inspection shows an occasional rabbit careful shooting is effective.

There is a strong demand for repellants that will effectively prevent damage to trees by mice and rabbits. In addition to being objectionable to these rodents, a repellant must adhere to the bark a long time, must not injure bark, buds or dormant plant tissue and should be relatively simple to apply. The Experimental Station at Scott has tested repellants suggested by growers and other sources but practically all failed on one or more of these essential requirements. More detailed studies are in progress on repellants in co-operation with the Forestry Nursery Station, Sutherland, Sask.

A number of repellants suggested by growers were found defective on one or more points. Lime wash and fresh blood from slaughtered animals did not adhere to trees long enough. Mixtures containing oil quite definitely had a toxic effect on bark, buds and wood of fruit trees. Mica axle grease did not appear to effect crabs but retarded growth of Opata cheery plum where it was also tried.

Good results were obtained by using a mixture of alcohol and rosin as a repellant for rabbits on fruit and other trees. The alcohol used must be denatured ethyl, available through your hardware or paint company. Lump rosin is used but it must be finely powdered before dissolving. The lumps can be crushed by placing it in a sack and using a wooden mallet. It can then be sifted through a piece of fly screen. The proportions are eight pounds of powdered rosin to a gallon of denatured ethyl alcohol. It is preferable to mix two pounds to a quart and use it right away as it must be kept in an airtight container after mixing. The rosin and alcohol are stirred until all dissolved. Under no circumstances can the solution be heated. It is well to keep in mind the size of the container when mixing, as the addition of the rosin in these proportions practically doubles the volume of alcohol.

A small paint brush is used to apply this repellant to the trees. If it becomes gummy while using, a small amount of alcohol can be added to restore the original condition. When applying, the bark must be absolutely dry, without mist or falling snow being present at the time. All parts of the trees which can or may be reached by the rabbits during the winter are treated. It is advisable to treat as early as possible in the fall for protection during the winter.

DDT

By W. S. McLEOD

Department of Entomology, University of Manitoba

It is a curious fact that DDT is rapidly becoming an old story to the general public and yet new facts concerning this wonder insecticide are being discovered every day. The fact that it was first produced by a German chemist over 70 years ago—that its marvellous powers as an insect-killer were not even suspected until 1939—that it eliminated the dreaded typhus from Allied army camps in North Africa and Italy—that it is considered to be one of the greatest discoveries to come out of this war—all these are well known and need not be told again. Yet the man in the street, and the scientist, too, really knows very little about DDT. A great deal of work remains to be done before it will be safe to sell this material in all its diverse forms to the public.

Here in the Department of Entomology of the University of Manitoba we have received samples of DDT in many different forms. First, of course, there is the pure DDT. It is a waxy, lumpy material which has a faintly sweetish odour. It is insoluble in water though it may be dissolved in many oils and other solvents. It is hard to say whether this is more of an advantage or a disadvantage. Naturally, if the DDT is sprayed on a plant and is fixed there by means of a suitable sticker, it will not wash off in the rain. On the other hand, many of the solvents are toxic to plants and it is necessary to dilute them in water to such a degree that they will be too weak to affect the leaves. This has made it necessary for scientists to do a great deal of work with chemicals which will bring about an emulsion of an oil solution of DDT in water. Much work still remains to be done in this regard.

Of course, if you wish to paint the DDT on the inside of a barn or other building, you may use a straight oil solution. Five percent solutions of DDT in kerosene are now on the market and have proved very effective in the barns at the University. It would be disastrous, however, to use these in your garden.

Another form of DDT is the 3% dust (Gesarol A³). It was prepared for use on plants and seems to offer great promise for horticultural and field crops purposes. Dusts containing 5% and 10% DDT have also been tested and it is probable that all of these will some day be sold for special purposes. First of all, however, it will be necessary for scientists to determine the effect of repeated applications of these dusts to plants and to the soil, their effect on the particular insect pest which it is desired to control, the possibility of killing animals or humans which may eat the plant or its fruit and the danger of killing the beneficial insects which visit these plants.

One type of DDT preparation which seems to offer some promise is a powder which mixes satisfactorily with water. This product goes under the code number of "AK²⁰" and contains 20% of DDT. An ounce of this powder mixed with a gallon of water gives a solution containing 0.125% DDT. This may sound rather dilute but it has been found to give some control of certain of the leaf-eating beetles and no doubt it will be investigated more fully as time goes on.

The waxy nature of the pure DDT make it very difficult to prepare dust mixtures which will contain more than 15 or 20% DDT. However, an American company has invented a machine which separates the pure material into extremely fine particles. The method of doing this has been kept a secret but we do know it is possible, by the use of these micronizing machines, to prepare dusts which contain as much as 50% of DDT. It was hoped to secure some of this 50% dust for experimental use at the University during the past season but the demand was so great that all orders could not be filled and we were unable to get any.

There is no doubt, that some day all of these preparations and a great many more will be available in the stores for the use of horticulturists and market gardeners. It must be kept in mind, however, that DDT is not likely to be a cure-all for every type of insect pest. It should also be remembered that careless use of this insecticide will certainly result in the death of many beneficial insects. Just as in the past, we will have to learn how to use our weapons correctly before we can expect to derive any good from them.

A special committee of entomologists was set up recently to study all of the information on DDT which is available at

the present time. Their report was too long to quote at this time but this is, briefly, what they had to say: "We feel that DDT is one of the greatest discoveries ever made in man's war against insects. We realize, however, that DDT is not and never will be the solution to all our insect problems. It will be of great help to us in our fight against three diseases, namely, malaria, typhus and yellow fever because it has been so effective against mosquitoes, fleas and lice. It will add to the comfort of our home life by killing many of the biting insects which bother us in summer time. Our farmers will find it a most important weapon against pests in the potato field, the orchard and on many vegetable and seed crops. It will allow us to control many of the insects which attack our livestock. But DDT will not kill all our insect enemies. Furthermore, it will certainly kill a large number of very useful and beneficial insects if it is not used intelligently. As yet we do not know nearly enough about the effect of this chemical on plants or animals or soils. We do know that oil solutions are dangerous to man and animals if applied to the skin though dusts appear to be safe enough unless they are swallowed. In other words, much research is still needed before it will be safe to put DDT on the market in large quantities.



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A CONTROL MEASURE for th BEAN BLIGHTS

By W. A. F. HAGBORG

Dominion Laboratory of Plant Pathology, Winnipeg

To the gardener who takes pride in his vegetable crop, the bacterial blights of beans often present a serious problem. In a severe attack, no pods may be set and in a light attack the disfigurement of the plants by infected areas on the leaves and by distorted growth may be objectionable, especially if the garden has been entered in a competition. In a school children's competition in 1945, contaminated beans were distributed inadvertently to the contestants. Blight was present in the resulting crop through no fault of the contestants, but many of them lost points at judging time on account of the blight. As the blight did not develop evenly in all gardens, an element of unfairness was introduced by not distributing disease-free seed.

From studies made at the Dominion Laboratory of Plant Pathology, Winnipeg, it appears evident that the bacterial infection of beans in Greater Winnipeg consists of two diseases, halo blight and common bacterial blight. These diseases are fairly similiar in appearance, but they are caused by different species of bacteria. Both diseases are carried on the seed and both are hard to detect. Effective methods of seed treatment entail not only laborious procedures, but also facilities for exact temperature control. Unfortunately blight-resistant varieties of beans as good as the best commercial varieties of snap beans are not available.

By far the best control measure at present is the use of seed that is free from these two diseases. Very marked progress has been made in developing a supply of such seed in California, where there are certain areas in which very low relative humidities prevail during the growing season, thus permitting the maintenance of freedom from bacterial diseases. Seed so produced is marketed as California Certified (Cal-approved), under the supervision of the University of California. To pass inspection, the seed must be grown from a crop that was inspected and found free of the bacterial blights. Eighty-five percent germination is required but 100 percent is sometimes achieved.

Growing Trials With Calapproved Seed

Enquiries made at Winnipeg showed that ordinary bean seed could be sold at a lower price than Calapproved seed. This difference in price may account for the absence of Calapproved seed from the Winnipeg market. With a view to giving the public an opportunity of demonstrating the value of disease-free seed, it was decided to distribute small lots of Calapproved seed to gardeners in the Greater Winnipeg area. It was hoped that in this way gardeners would be able to decide for themselves if it is profitable to use disease-free seed. The co-operation of the Extension Service of the University of California resulted in a gift of 100 pounds of Giant Stringless Green Pod seed and 100 pounds of Bountiful seed. This seed was donated by a farmers' co-operative, the California Co-operative Seed Bean Growers' Association. It was distributed by the Dominion Laboratory of Plant Pathology to some 400 growers through the courtesy of the Fort Garry and Winnipeg Horticultural Societies. An examination of 28 of the resulting plantings gave evidence indicating that the Calapproved seed had been free of bacterial diseases. Infection was present in only 4 of the 28 plantings, and then only to the extent of a trace to 1 percent. In each of these four instances, the disease may have spread from a more heavily infected planting, found within a distance of 100 feet, which had been grown from ordinary seed. An examination was also made of 23 plantings in the Greater Winnipeg area grown from ordinary seed. Fifteen of them proved to be diseased, with infections ranging from 3 to 80 percent.

On November 1, 1945, a questionnaire was mailed to 355 of the 400 gardeners who received samples of the Calapproved seed. The majority of those who replied considered plants

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grown from California Certified Seed superior to those from non-certified seed in both vigor and freedom from disease (Table 1).

Table 1.

**Opinion of Gardeners in Greater Winnipeg Regarding the Crop
From California Certified Bean Seed As Compared
With That From Non-Certified Seed**

Class	Number of Replies Received in Regard to:	
	Vigor	Freedom From Disease
Calapproved better than non-certified	89	95
Calapproved equal to non-certified	21	13
Calapproved worse than non-certified	1	1
No opinion expressed	2	4
Total	113	113

One hundred and five said they would prefer such seed to uncertified seed, four said they would not and four were undecided. Ninety-two believed that the advantages warranted the payment of a small premium for such seed. Numerous enthusiastic statements as to the high yield, freedom from disease, and the good eating qualities of Calapproved beans were received. In only two cases were the remarks unfavorable.

The foregoing results should furnish some guidance to both gardeners and seed distributors with respect to the value of disease-free seed in Manitoba.

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ERADICATING DANDELIONS with 2,4-D

H. E. WOOD, Manitoba Weeds Commission

Who has not faced the problem, probably annually, of how to rid his lawn of dandelions? For many years now one product after another has been brought out as a "sure cure" for the pest. However, the dandelion persists. One after another, the panaceas are forgotten. All the while experts on lawn management have stressed proper lawn building and care, as a preventative against dandelions. We cannot emphasize too strongly this approach. Where a thick, dense turf is maintained dandelions and other lawn weeds seldom get beyond control. However, we have been asked to report upon the newest of chemical preparations which seems to be really tough on dandelions—2,4-Dichlorophenoxyacetic acid—popularly known as 2,4-D.

Since about a year ago a number of articles have appeared—one in "Better Homes and Gardens"—describing this sensational new herbicide. Claims made are that 2,4-D when sprayed on weeds will kill them without harming the grass or grain in which they grow.

2,4-D is not a new chemical. It is one of the hormones that have been in use for some time in regulating plant growth. It was found that when used in slightly larger amounts this acid was toxic to certain plants. This started investigation work into the herbicidal properties of the product. The Weeds Commission of the Manitoba Department of Agriculture, in co-operation with the Division of Plant Science of the University of Manitoba, early in 1945 made plans whereby 2,4-D would be tried on a number of weeds under Manitoba conditions.

Arrangments were made with the help of the Division of Plant Industry, United States Department of Agriculture, whereby four companies supplied material for testing. Later three other companies requested their products be used, so that in all seven companies provided nine different 2,4-D preparations. Pure 2,4-D is not readily soluble in water so is combined with a solvent at the time of manufacture. Considerable attention on the part of the manufacturers is being given to the matter of determining what is the most suitable solvent. Two products had "Carbowax 1,500" as a base; one was a liquid; the others in powder or crystal form.

Mr. George Fraser, who had obtained his discharge from the R.C.A.F. was engaged to carry on the field work. It was

decided to follow the manufacturer's instructions in general as to concentration and rate of application. In all cases the chemical was diluted in water, concentrations being approximately .1%—1 part 2,4-D to 1,000 parts water. All solutions were mixed in the laboratory and carried in cans to the field.

Plots of uniform size—one-half square rod or approximately $11\frac{1}{2}$ by $11\frac{1}{2}$ feet—were adopted. A three-gallon knapsack sprayer was used. The usual application for lawn work was three pints of solution to the half square rod (120 gallons per acre). This gave the grass and weeds a good wetting. Damp weather before or after application was avoided in as far as possible. Temperatures at time of application varied from quite cool in spring and early summer, to hot in mid-summer.

Trials throughout the summer included quite a number of weeds, some of which were: Dandelion, Plantain, Chickweed, Sow Thistle, Canada Thistle, Leafy Spurge, Hedge Bindweed, Field Bindweed, False Ragweed, Stinkweed, Wild Mustard, Poison Ivy, Gum Weed, Slender Nettle. A total of 310 plots containing one or more of the above weeds, were treated with 2,4-D preparations. The results showed much variation, especially so, on the deeper rooted perennial weeds. However, the results on lawn work were the most satisfactory and gave the most conclusive results.

A total of 139 plots were given over to eradicating weeds on lawns—dandelions and broad-leaved plantain. The work was carried out on the lawns at the Legislative Building, Winnipeg, the University of Manitoba, Fort Garry site, and the Dominion Experimental Station, Morden. In addition, a number of heavily infested plots on vacant lots and several private lawns in Winnipeg were treated.

To determine whether one time of the year was better than another to apply the chemical, treatments were started in late May and continued at intervals to the middle of September when cool and wet weather prevented further trials. The first treatments were made just previous to dandelions coming into flower, later with the plants in full bloom, others again when seed had formed, followed by various stages of summer and fall dormancy. Plots on vacant lots were selected for and fall dormancy. Plots on vacant lots were selected for dense infestation and rank growth of dandelion, usually in full flower.

Most of the plots treated with 2,4-D preparations were done so at the concentration and rate recommended by the manufacturer. This ranged from .1% to .2% free 2,4-D acid, or 1 to 2 parts per thousand. On half-square rod plots from

2 to 4 pint, or 80 to 160 gallons per acre of solution were applied. It was found 120 gallons per acre gave ample wetting. Were vegetation quite rank a heavier application might be advisable. Much experimental and research work still requires to be carried out to ascertain the optimum concentration and rate of application.

While final results will not be available until well into the summer of 1946, apparent results have been most promising. With the exception of the occasional plant of dandelion or plantain on a few of the plots, all plants appear to have been eradicated. Very little difference was to be noted between the "kills" secured by the different companies' products. Where two different concentrations of the same product were used the heavier concentration appeared to give slightly better results. Little difference was noted between the rates of application although the lighter application (80 gallons per acre) seemed hardly sufficient to wet the vegetation well. On a few plots, noticeably at Morden, some re-infestation appeared late in the season.

No damage to the grass was noted on any of the plots. White Dutch clover present on perhaps 50% of the plots was "set back" at the time of treatment but later recovered. Where the stronger concentration was used some thinning of the clover seemed apparent. The season of the year that application was made appeared to make no difference. Likewise the temperature of the weather at time of application.

Under date July, 1945, the United States Department of Agriculture issued a circular "Killing Weeds With 2,4-D" from which we quote:

"Dandelions, plantains, and many other weeds can be killed with little difficulty or expense by spraying them with 2,4-D.

"2,4-D in the **right mixture** can be used on most lawn, golf courses, grain fields and areas bearing other plants of the grass family. It does affect bent grass and anyone with a bent grass lawn should be cautious about this new treatment. It will kill or seriously retard the growth of White Dutch clover.

"Lawns effectively treated with the 2,4-D Carbowax mixture will be free of dandelions and plantains for 2 to 3 months. Later it may be necessary to re-treat the area to kill seedling plants that have grown since the first spraying.

"2,4-D is non-corrosive and non-inflammable."

It is to be expected that a number of 2,4-D preparations will soon be on the market. In using them the manufacturers' instructions should be followed.

Winnipeg Horticultural Society

Report of Home Grounds Committee for 1945

The annual home grounds competition for 1945 was very satisfactory to your directors as we had entries from 38 of our members as against 25 for 1944 and 16 for 1943.

There were 9 sections in the competition and out of the 38 exhibitors 22 received prizes.

The competition was made possible by the generosity of the friends of the society, who contributed the prizes. The donors were: The Winnipeg Tribune, who donated \$40.00 in cash, the Winnipeg Supply & Fuel Co., Patmore Nursery Co., Wallace Nuresries Ltd., Hudson's Bay Co., Antenbring's Ltd., Manitoba Hardy Plant Nursery, Swift Canadian Co., The J. H. Ashdown Co., Morden Nurseries, Winnipeg Hydro Electric System, McFayden Seed Co., and Dr. S. W. Edgecombe.

The judging was done on August 7th and 8th, by W.R. Leslie of the Experimental Station, Morden, Man., and Prof. E. T. Andersen, Professor of Horticulture, University of Manitoba.

The winners were:

Sec. 1—Lots up to 34 ft. —

- 1st. R. Skelding
- 2nd F. Edwards
- 3rd F. R. Brittain
- 4th A. Goodall.

Sec. 2—Lots 34 to 66 ft.—

- 1st P. H. Hammon
- 2nd J. Campbell
- 3rd R. Preston
- 4th A. Dance.

Sec. 3—Lots over 66 ft.—

- 1st. Alfred Potter
- 2nd Peter Flinn

Sec. 4—Utility Garden—

- 1st. A. Dance
- 2nd T. Minshull
- 3rd Thos. Dinicol
- 4th C. C. Jackson

Sec. 5—Flower Garden—

- 1st Mrs. W. J. Murray
- 2nd A. Dance
- 3rd J. Campbell
- 4th P. H. Hammond

Sec. 6—Window Box—

- 1st A. Goodall
- 2nd Mrs. W. J. Murray
- 3rd R. Skelding
- 4th A. R. Fear

Sec. 7—Lawns—

- 1st J. Campbell
- 2nd Alfred Potter
- 3rd F. R. Brittain
- 4th R. Preston

Sec. 8—Rock Gardens—

- 1st Mrs. W. J. Murray
- 2nd George Walsh
- 3rd Mrs. J. C. Hack
- 4th Mrs. W. W. Gyles

Sec 9, Novice Home Grounds

- 1st Mrs. W. J. Murray
- 2nd Mrs. C. Biggar
- 3rd R. W. Bunyon
- 4th W. C. Edgar

R. W. BROWN, Chairman.

Winnipeg, November 29th, 1945.

FLOWER and VEGETABLE SHOW

The following is an approximate list of classes in the 1946 Flower and Vegetable Show of the Winnipeg Horticultural Society, published for the guidance of prospective exhibitors:

CLASS 1.—CUT FLOWERS

- | | |
|-------------------------------------|--|
| Asters, vase. | Sweet Peas, vase. |
| Asters, basket. | Table Centre, containing Sweet Peas. |
| Carnations, vase. | Table Centre, other than Sweet Peas. |
| Cornflower, vase. | Table Centre, modernistic. |
| Cosmos, vase. | Zinnia, vase (large flowered). |
| Dahlias, vase, 3 blooms. | Zinnia, basket (large flowered) |
| Dahlias, basket. | Zinnia, vase (Pom-pom). |
| Dahlia, best individual bloom. | Zinnia, basket (Pom-pom). |
| Dahlias, small flowering, vase. | Mixed Flowers, vase. |
| Dahlias, small flowering, basket. | Mixed Flowers, basket. |
| Gladioli, vase (at least 3 spikes). | Any other flower not mentioned, one variety, vase. |
| Gladioli, basket. | Collection, Cut Flowers, 6 vases, different. |
| Gladioli, best individual spike. | Display of Cut Flowers, 6 ft. x 4 ft. (named). |
| Marigolds, vase (African type). | Collection of Gladioli: 6 vases, 3 spikes to a vase (named). |
| Marigolds, basket (African type). | Display of potted Plants, at least 6 kinds. |
| Marigolds, vase (French type). | Display of Tuberous Begonias in pots, at least 3. |
| Marigolds, basket (French type). | Display of Sweet Peas, 6 ft. x 4 ft. (named). |
| Pansies, bowl. | Display of Sweet Peas, over 6 ft. (named). |
| Petunias, vase (double). | |
| Petunias, basket (double). | |
| Petunias, vase (single). | |
| Petunias, basket (single). | |
| Roses, bowl. | |
| Rose, best individual bloom. | |
| Snapdragon, vase (tall). | |
| Snapdragon, vase (medium). | |
| Snapdragon, basket. | |
| Stocks, vase. | |

CLASS II.—VEGETABLES

- | | |
|--------------------------------|-----------------------------------|
| 12 Beans, broad. | Parsley, one plant in pot. |
| 12 Beans, bush, yellow. | 5 Potatoes, white. |
| 12 Beans, bush, green. | 5 Potatoes, pink or red. |
| 12 Beans, any other variety. | 1 Pumpkin. |
| 5 Beets, globe. | Peas, 12 pods. |
| 2 Broccoli. | 2 Peppers, green. |
| 2 Cabbages. | 2 Peppers, red. |
| 2 Cauliflower. | 5 Rhubarb, 5 stalks. |
| 5 Carrots. | 2 Squash. |
| 2 Celery, any variety. | 5 Tomatoes, ripe, small type. |
| 2 Citron. | 5 Tomatoes, ripe, large type. |
| 5 Ears Sweet Corn. | 5 Tomatoes, green. |
| 2 Cucumbers, frame. | 2 Turnips, Swedes, for table use. |
| 2 Cucumbers, outdoor. | Any other vegetable. |
| 3 Kohlrabi. | (Non-professional) A display of |
| 2 Marrows. | vegetables, not less than 12 dis- |
| 12 Onions, multiplier. | tinct kinds, to occupy a space |
| 5 Onions, yellow or red. | 3 ft. x 4 ft. |
| 5 Onions, white. | Display of vegetables, not less |
| 5 Onions, large. | than 12 distinct kinds, to occupy |
| 1 Pint Pickling Onions, white. | space of 4 ft. x 6 ft. |
| 5 Parsnips. | |

Display open to market gardeners or any other exhibitor.

Display to be considered when judging.

CLASS III.—CANNED VEGETABLES AND FRUIT

- | | |
|------------------------------------|------------------------------------|
| 1 pint or 1 quart of canned beets. | 1 pint or qt. canned crabapples. |
| 1 pint or 1 quart of canned beans. | 1 pint or qt. of canned currants. |
| 1 pint or 1 quart of canned corn. | 1 pint or qt. canned gooseberries. |
| 1 pint or 1 quart of canned peas. | 1 pint or qt. of canned plums. |
| 1 pint or 1 quart canned tomatoes. | 1 pint or qt. of canned cherries. |
| 1 pint or 1 quart of any other | 1 pint or qt. canned raspberries. |
| vegetable. | 1 pint or qt. canned strawberries. |
| Collection of canned vegetables. | Collection of canned fruit. |

PROVINCIAL FRUIT SHOW

Collection Standard Apples, 5 or more varieties, 5 of each (preferably named).

Apples, any variety or Seedling, 2½ inches or more; best plate of 5 (plates in collection eligible).

Collection of Crabapples, 5 or more varieties, 10 of each (preferably named).

Best Plate of 10 (plates in collection eligible).

Collection of Plums, 5 or more varieties, 10 of each (preferably named).

Plums, any variety of Seedlings, best plate of 10. (Plates in collection eligible.)

Collection of other Fruits, 5 or more kinds, plate of each (preferably named).

Any other Fruit, best plate. (Plates in collection eligible.)

One Plate Standard Apples, any variety.

One Plate Crabs.

One Plate Plums.

Special Notice

This year for the first time we plan to hold in conjunction with our flower and fruit show an exhibition of home craft. Fuller details will be furnished at a later date.

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